SocTek® Modules



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

SMARTmpsoc Module

Overview

SMARTmpsoc 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 SMARTmpsoc module is built on the AMD/Xilinx Zynq UltraScale+ Multi-Processor System-on-Chip (MPSoC).

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 SMARTmpsoc 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 SMARTmpsoc 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/Quad-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 SMARTmpsoc 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
- 3x FPGA transceivers available through the B2B connectors: 10BASE-T, 100BASE-TX, 1000BASE-T, SGMII, 100BASE-FX and 1000BASE-X

Memory

- 2GB DDR4 memory
- 256Mb Quad SPI Flash
- 2Kbit EEPROM with unique MAC address available for the user
- 512 bit user-programmable EEPROM for key storage with SHA-256 hash algorithm protection
- 16GB of eMMC flash to be used as a primary and/or secondary boot device

SoC

- AMD Zynq™ UltraScale+ SoCs (ZU3CG/ ZU3EG)
  - Dual-Core / Quad-Core ARM Cortex-A53 MPCore
  - Dual-Core ARM Cortex-R5F MPCore
- FPGA (Artix-7 PL equivalent) resources
  - 154K Logic Cells
  - 71,000 CLB Look-up Tables (LUTs)
  - 141,000 CLB Flip-Flops
  - Total Block RAM 7.6Mb

Other Interfaces

- 38x Zynq SoC PS & PL GPIO available at the board-to-board connector
- FTDI Connector
- Debug Connector (JTAG)
- Real Time Clock
- TPM: Trusted Platform Module 2.0 security Chip
- USB 2.0

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 15mm(H), Weight: ~36g
- 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
SOM00.21-ID4 (SMARTmpsoc module ZU3CG)
EVB07.27 (SMARTmpsoc brick)

To know more about other available references, please contact your sales representative.

Functionality Examples

- 4x 1G external ports managed Ethernet switch with IEEE1588 (PTP)
- HSR/PRP Redundancy Box (RedBox)
- HSR Ring coupler (QuadBox)
- TSN Endpoint implementation with port redundancy (FRER)
- 4x 1G external ports TSN Switch

Evaluation & Design-in Kit

Description

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

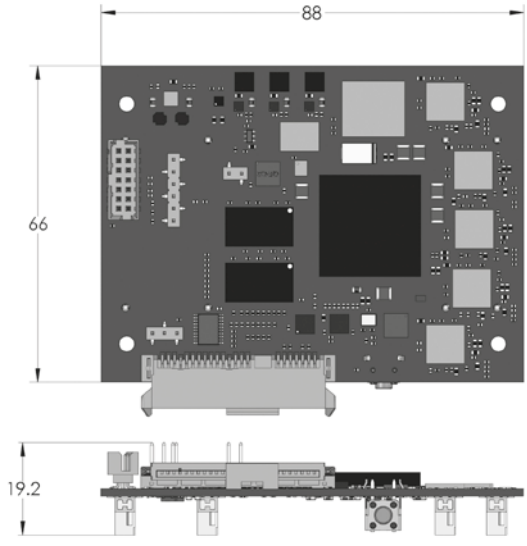
Features

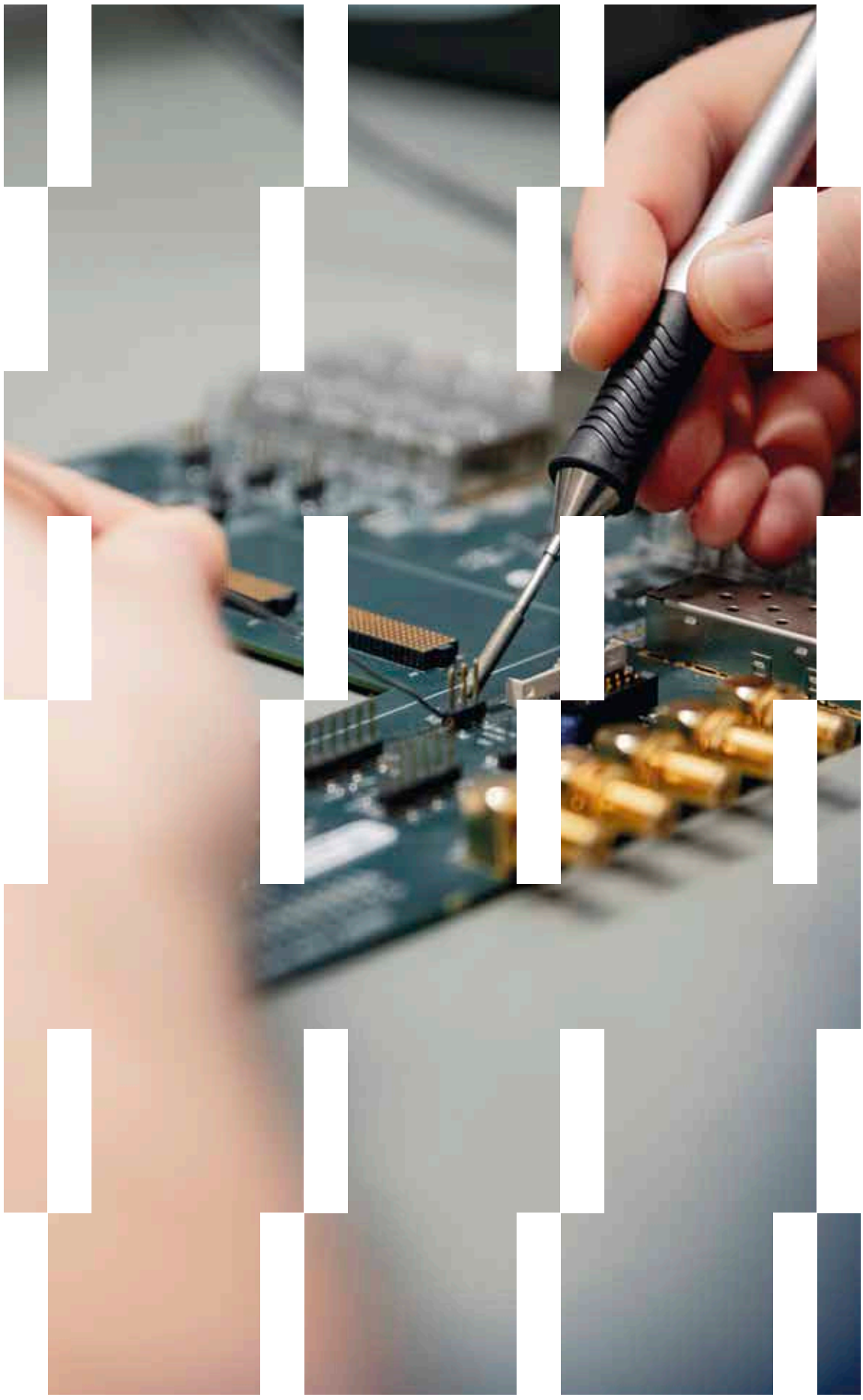
- 4x SFP cages for 1000BASE-T, 100BASE-TX, 10BASE-T, 100BASE-FX or 1000BASE-X
- 1x RJ45 for 1000BASE-T, 100BASE-TX or 10BASE-T
- UART console (USB)
- 2x PMOD connectors

SMARTmpsoc brick consists of the following package

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

Dimensions





SocTek®

By

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