![MicroSys logo] **MicroSys**
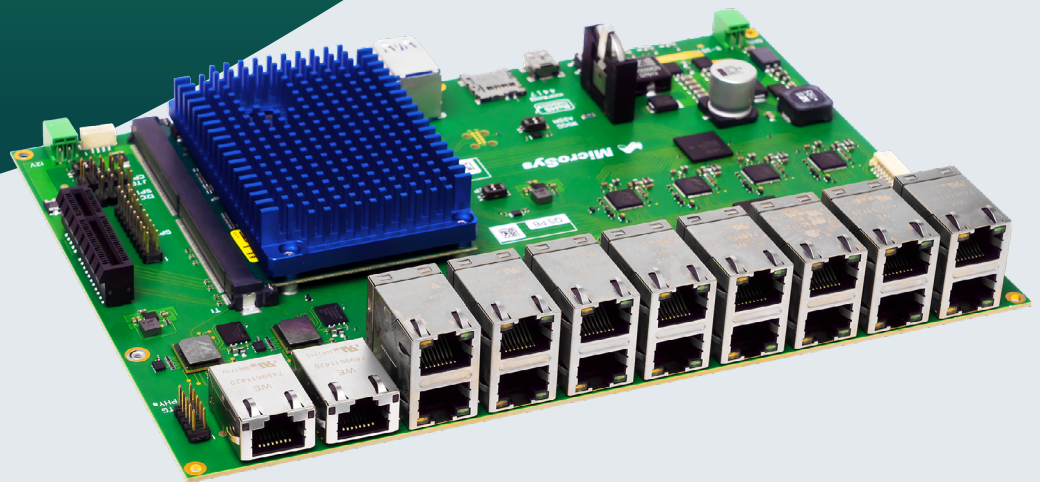Creating Embedded Systems

Arm® Architecture

miriac® SBC-LS1043A-TSN

Single Board Computer based on
NXP® QorIQ® LS1043A CPU

Single Board Computer at a glance

- 1× 10 Gb Interfaces for High Speed Ethernet

- 8× 1 Gb TSN connectors (driven by 2 switches) for reliable real time communication over Ethernet

- NXP® QorIQ® LS1043A quad core Arm® Cortex®-A53 CPU

- All on board supply voltages are monitored by a separate μ-controller.

- ECC Memory, Encryption (optional)

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Product Description

The miriac® SBC-LS1043A-TSN platform is part of a system family to address the increasing communication demand in industrial applications. For that the carrier offers the support of the Time Sensitive Net-working Standard (TSN) and holds a high-performance networking infrastructure. It integrates for example 1x 10 Gb and up to 4x 1 Gb Ethernet ports, 1x PCIe x4 port and 8x 1 Gb TSN connectors (driven by 2 switches) for reliable real time communication over Ethernet.

Specifications

CPU	
Architecture	Arm® Cortex®-A53
Processor	NXP® QorIQ® LS1043A CPU: 4 Arm® Cortex®-A53 64-bit cores at up to 1.6 GHz core frequency
DRAM	Up to 4 GB 32-bit DDR4 ECC RAM

Memory	
Flash	Up to 2 GB SLC NAND Flash & up to 16 MB SPI Flash
Flash Card	Yes
Boot Flash	QSPI, SD/MMC, NAND Flash

Ethernet	
10GbE	1x
1GbE	4x
TSN / IEEE 1588	8x 1 Gbit TSN

High Speed IO	
USB 3.0	2x
miniUSB	1x debug
PCIe	1x PCIe x2/x1 via edge card connector

IO	
Flex SPI	1x
UART	3x
I²C	1x
JTAG Debug Interface	Yes

Operating Condition	
Power Supply Voltage	Single 9 to 36 V DC input supply voltage range
RTC	Yes
RTC-Buffer	CR2032 battery
Temperature	0 °C to 70 °C

⊞ Specifications

Mechanical	
Dimensions	220 mm x 150 mm

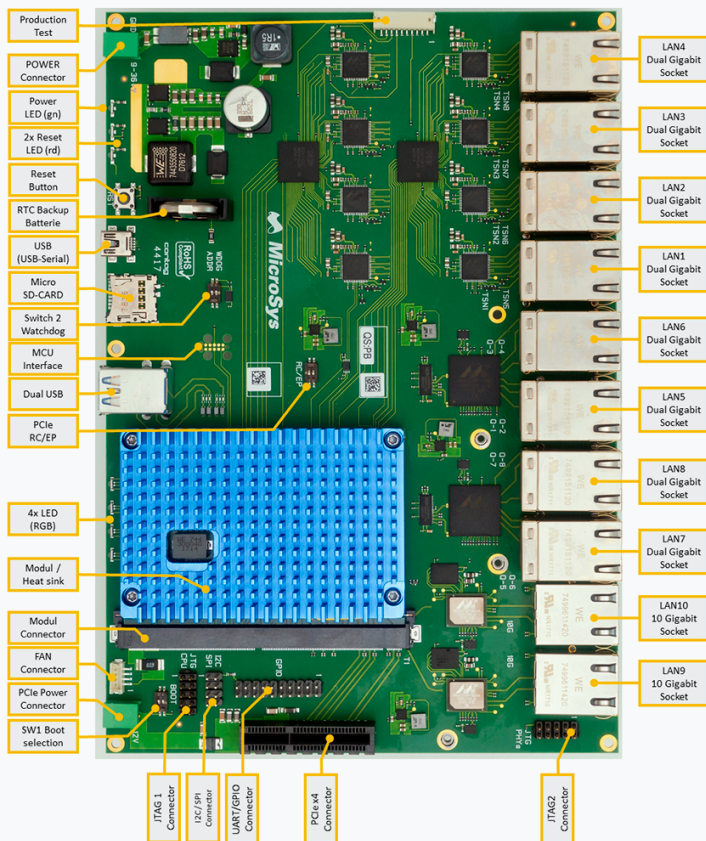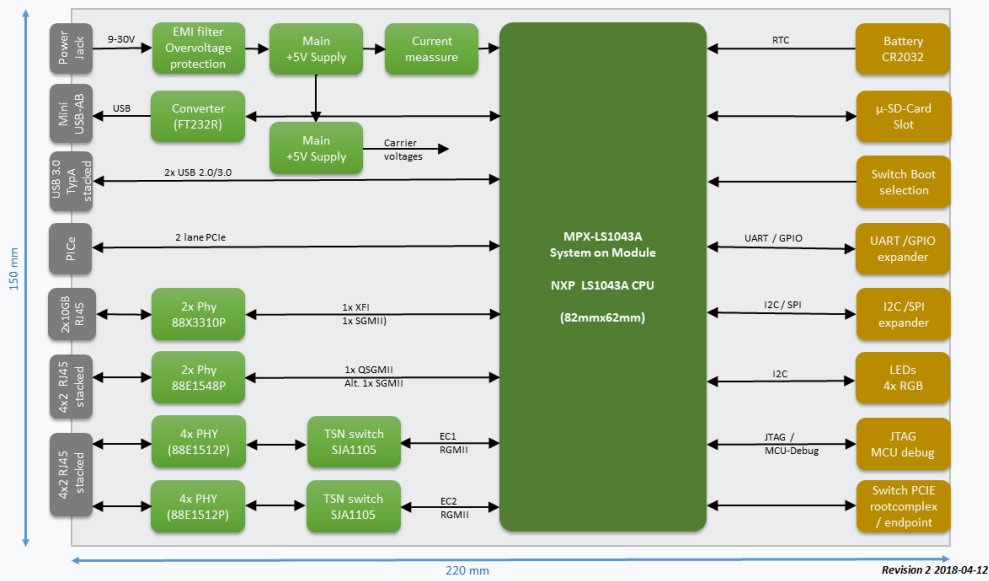| Software / Additional	
Software Support	- Linux - VxWorks (on request) - Others (on request)
Additional	4x RGB LED - Compatible variants available with QorIQ LS1023A, LS1043A, LS1048A, LS1088A, - Temperature sensor - PCIe rootcomplex or endpoint switchable - Overvoltage protection - Dev Kit for immediate start up, e.g. power supply, cables (optional)

General note:

Our standard product versions offer what we consider to be the optimum configuration in terms of performance, price, usage and TDP. The product features lists specify the maximum range of functions per interface. However, not all interfaces or functions are always available in parallel. Flexible SERDES multiplexing is one of the reasons for this. In addition, we provide multiple memory expansion options and are also happy to accommodate specific customer wishes. So do not hesitate to contact us directly to discuss your desired configuration.

Block diagram

Block diagram:

- Power Jack — 9-30V — EMI filter Overvoltage protection — Main +5V Supply — Current measure
- Mini USB-AB — USB — Converter (FT232R)
- Main +5V Supply — Carrier voltages
- USB 3.0 TypA stacked — 2x USB 2.0/3.0
- PICe — 2 lane PCIe
- 2x 10GB RJ45 — 2x Phy 88X3310P — 1x XFI 1x SGMII)
- 4x2 RJ45 stacked — 2x Phy 88E1548P — 1x QSGMII Alt. 1x SGMII
- 4x2 RJ45 stacked — 4x PHY (88E1512P) — TSN switch SJA1105 — EC1 RGMII
- 4x PHY (88E1512P) — TSN switch SJA1105 — EC2 RGMII

Center: **MPX-LS1043A System on Module** / **NXP LS1043A CPU** / **(82mmx62mm)**

Right side:
- RTC — Battery CR2032
- μ-SD-Card Slot
- Switch Boot selection
- UART / GPIO — UART /GPIO expander
- I2C / SPI — I2C /SPI expander
- I2C — LEDs 4x RGB
- JTAG / MCU-Debug — JTAG MCU debug
- Switch PCIE rootcomplex / endpoint

150 mm

220 mm

Revision 2 2018-04-12

Left labels: Production Test, POWER Connector, Power LED (gn), 2x Reset LED (rd), Reset Button, RTC Backup Batterie, USB (USB-Serial), Micro SD-CARD, Switch 2 Watchdog, MCU Interface, Dual USB, PCIe RC/EP, 4x LED (RGB), Modul / Heat sink, Modul Connector, FAN Connector, PCIe Power Connector, SW1 Boot selection

Bottom labels: JTAG 1 Connector, I2C / SPI Connector, UART/GPIO Connector, PCIe x4 Connector, JTAG2 Connector

Right labels: LAN4 Dual Gigabit Socket, LAN3 Dual Gigabit Socket, LAN2 Dual Gigabit Socket, LAN1 Dual Gigabit Socket, LAN6 Dual Gigabit Socket, LAN5 Dual Gigabit Socket, LAN8 Dual Gigabit Socket, LAN7 Dual Gigabit Socket, LAN10 10 Gigabit Socket, LAN9 10 Gigabit Socket

Order Information

Name	Code	Description	Status
miriac® SBC-LS1043A-TSN	856401	includes MPX-LS1043A SoM (order # 855605) with 1.6 GH, 4 GB DDR4 RAM (64 Bit), ECC, Encryption, 512 MB Flash	active
miriac® SBC-LS1043A-TSN Development Kit	856410	for MPX-LS1043A SoM, includes order # 856401, Linux BSP, accessories	active

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