TE0630 Overview

Trenz Electronic TE0630 series are industrial-grade FPGA micro-modules integrating a leading-edge **Xilinx Spartan-6 FPGA**, a mini-**USB** 2.0 device port, 1 Gbit (128-Mbyte) **DDR3** SDRAM with 16-bit width, 8 Mbyte **Flash** memory for configuration and operation, and powerful switch-mode power supplies for all on-board voltages. A large number of configurable I/Os are provided via rugged high-speed stacking connectors. TE0630 is fully mechanically and largely electrically backward **compatible with Trenz Electronic TE0300** Xilinx Spartan-3E FPGA micro-modules.

All this on a tiny footprint, **smaller than a credit card**, at the most competitive price. Hardware and software development environment as well as reference designs are available free of charge.

Recommended Hardware

- Trenz Electronic TE0303 carrier board
  or
  Trenz Electronic TE0304 demo board
- JTAG programming cable

Recommended Software

- Trenz Electronic TE0630 LX45: Xilinx ISE WebPACK (free license)
- Trenz Electronic TE0630 LX75: Xilinx ISE WebPACK (free license)
- Trenz Electronic TE0630 LX100: Xilinx ISE Design Suite (you need to buy a license)
- Trenz Electronic TE0630 LX150: Xilinx ISE Design Suite (you need to buy a license)
- To use Trenz Electronic reference designs, you need one of the following Xilinx software licenses:
  - Xilinx WebPACK + EDK (Embedded Development Kit) stand-alone (TE0630 LX45 and LX75 only)
  - Xilinx ISE Design Suite - Embedded Edition
  - Xilinx ISE Design Suite - System Edition

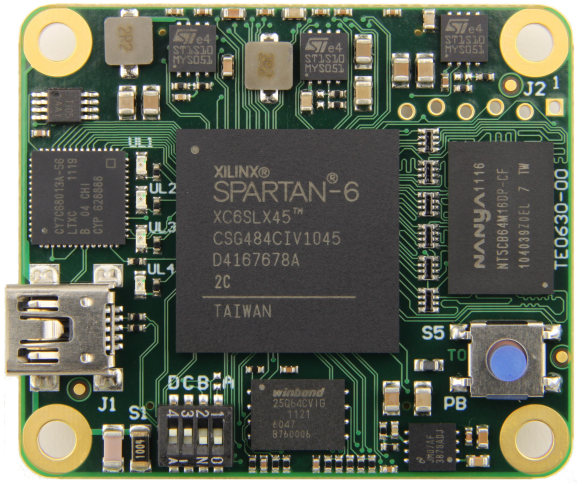
You can find all Xilinx ISE versions here.

Sample Applications

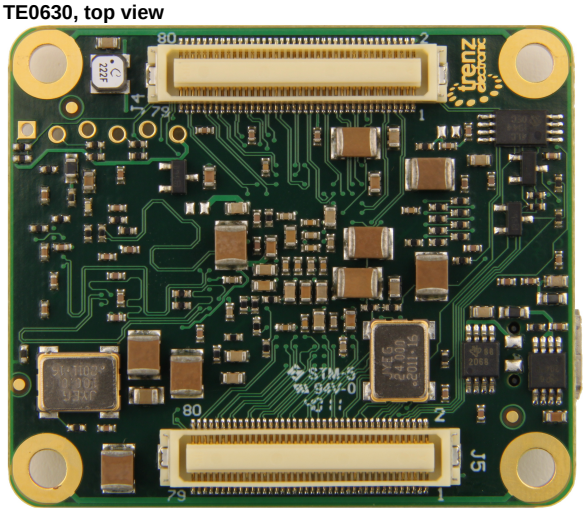
- Cryptographic hardware module
- Digital signal processing
- Embedded educational platform
- Embedded industrial OEM platform
- Embedded system design
- Emulation platforms
- FPGA graphics
- Image processing
- IP (intellectual property) cores
- Low-power design
- Parallel processing
- Rapid prototyping
- Reconfigurable computing
- System-on-Chip (SoC) development

Key Features

- Industrial-grade **Xilinx Spartan-6 LX** FPGA micro-module (45 /75/100/150)
- mini-USB 2.0 high-speed device (for configuration and operation)
- 16-bit-wide 1 Gb (128 MB) **DDR3 SDRAM**
- 64 Mbit (8 Mbyte) **SPI Flash** memory (for configuration and operation) accessible through:
  - FPGA
  - JTAG port (SPI indirect)
  - USB
- FPGA configuration through:
  - B2B connector
  - JTAG port
  - SPI Flash memory
- Plug-on module with 2 × 80-pin stacking connectors
- Up to **40 differential** and up to **109 single-ended** FPGA I/O pins available on B2B connectors
- 1.2 V, 1.5 V, 2.5 V = VCCAUX and 3.3 V power rails
- 24 MHz and 100 MHz reference clock signals
- eFUSE bit-stream encryption (LX75 or larger)
- 4 user LEDs
- 1 user push-button
- 2 user DIP switches
- Evenly-spread supply pins for good signal integrity
- Other assembly options for cost or performance optimization available upon request



TE0630, top view



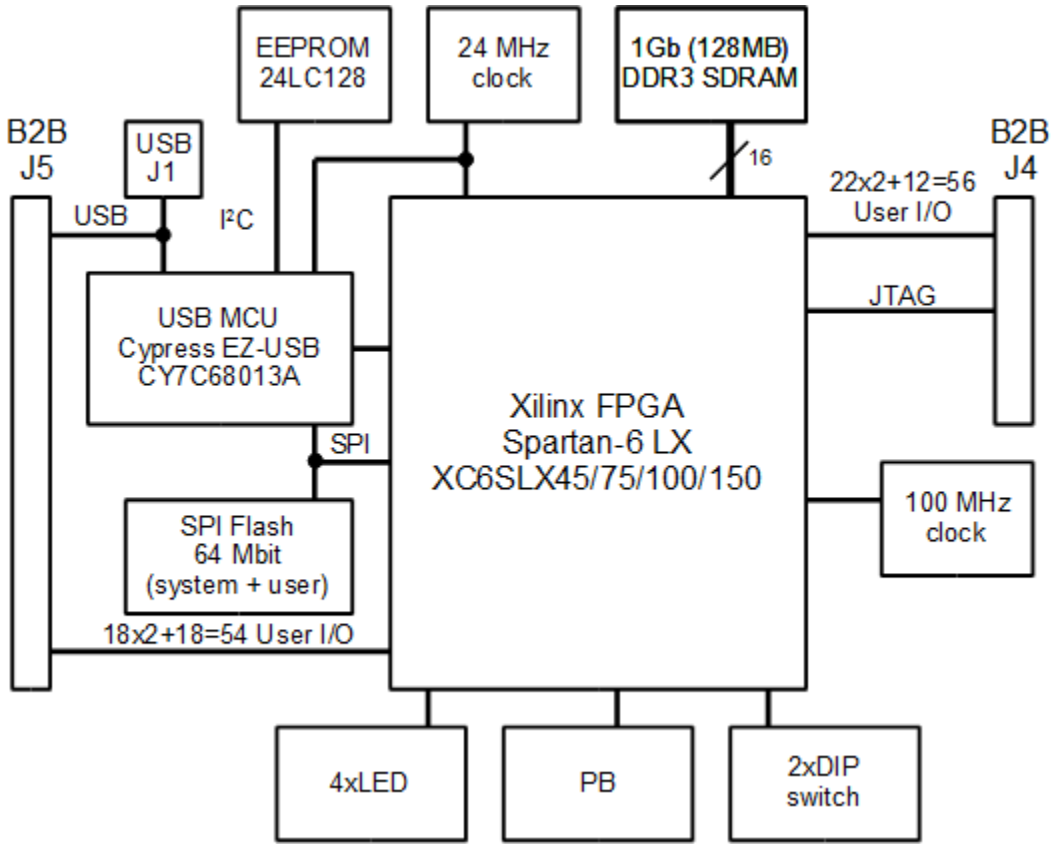
TE0630, bottom view

Specifications

- Xilinx Spartan-6 LX FPGA:
  - XC6SLX**45**-2CSG484**C** = 43 k logic cells, commercial grade
    XC6SLX**45**-2CSG484**I** = 43 k logic cells, industrial grade
  - XC6SLX**75**-2CSG484**C** = 74 k logic cells, commercial grade
    XC6SLX**75**-2CSG484**I** = 74 k logic cells, industrial grade
  - XC6SLX**100**-2CSG484**C** = 101 k logic cells, commercial grade
    XC6SLX**100**-2CSG484**I** = 101 k logic cells, industrial grade
  - XC6SLX**150**-2CSG484**C** = 147 k logic cells, commercial grade
    XC6SLX**150**-2CSG484**I** = 147 k logic cells, industrial grade
- Cypress CY7C68013A-56LFXC EZ-USB FX2LP™:
  USB microcontroller, high speed USB peripheral controller
- 16-bit-wide (data-bus) 1 gigabit (128 megabyte) DDR3 SDRAM
- 64 megabit (8 megabyte) serial Flash memory with dual/quad SPI interface
- 2 x fine-pitch (0.5 mm) 80-pin board-to-board connectors Hirose DF17 series
- Up to 40 differential FPGA input/output pins available on B2B connectors
- Up to 109 single-ended FPGA input/output pins available on B2B connectors
- USB and JTAG pins available on B2B connectors
- 4 A (3 A REV00) high-efficiency DC-DC switching regulator for power rail 1.2 V
- 3 A (1.5 A REV01) high-efficiency DC-DC switching regulator for power rail 1.5 V
- 0.8 A DC-DC linear regulator for power rails 2.5 V and VCCAUX
- 3 A (1.5 A REV01) high-efficiency DC-DC switching regulator for power rail 3.3 V
- Power supervisory circuits with power-fail
- Power supply voltage range: 4.0 to 5.5 V
- Power supply source: USB port, board-to-board interconnect (e. g. carrier board)
- Dimensions: 47,5 × 40.5 mm (19.2 cm^2)
- Minimum height: TBD (without connectors)
- Minimum height on carrier board: TBD
- Weight: 14.0 to 14.5 g
- Temperature grades:
  - commercial (C-type FPGA device)
  - industrial (I-type FPGA device)

References

- manufacturer name: Trenz Electronic GmbH
- manufacturer part name(s) = manufacturer part code(s)
  - TE0630 XC6SLX45-2CSG484C = TE0630-00
- manufacturer part page: this page
- documentation archive: TDB



TE0630 block diagram