

TRENZ ELECTRONIC CATALOGUE

Electronic Design Service

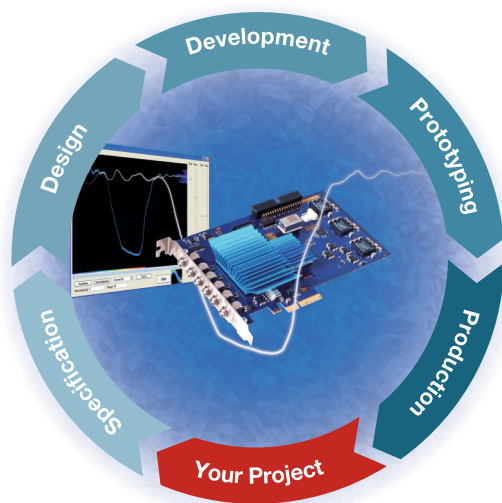
Development, Manufacture and Supply of FPGA and SoC Modules

updated september 2020

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Trenz Electronic GmbH operates as a provider of development services in the electronic industry since 1992. Our services include design-in support as well as turnkey designs which typically covers all steps from product specification, hardware and software design up to prototyping and production.



We are particularly specialized in the design of high-speed data acquisition, high-accuracy measurement and embedded digital signal processing systems based on FPGA and CPU architectures.

Many of our products are compatible with some widespread form factors. We also provide SoM products for Automotive industry and high-end applications.

In the event that an off-the-shelf FPGA board won't fit the customers requirements, the design can be easily adapted by our comprehensive engineering design service.

Our in-house EMS and worldwide supply of FPGA and SoC modules complete the portfolio. All modules produced by Trenz Electronic GmbH are developed and manufactured in Germany.

Other assembly options of our modules for cost or performance optimization plus high volume prices are available on request. Also, cooling solutions and several carrier boards are at hand.

Hardware Design

- System architecture and design
- Hardware integration (Design-In)
- Ultrafast digital logic
- Analog and mixed signal
- Digital signal processing
- Schematic capture and PCB layout

HDL Design

- FPGA and System-On-Chip design
- System design and synthesis
- HDL design (VHDL, Verilog)
- Integration of soft-cores
- USB, PCI-Express, Gigabit Ethernet
- Ultrafast ADC/DAC interfaces

Software Development

- Device driver and application software development
- Software and Firmware development

- Extended device life cycle
- Rugged for industrial applications
- Automotive grade available
- Small and powerful
- Customizable
- Development and design service
- Rapid Prototyping
- Cooling solutions
- Carrier and testboards
- Free documentation and designs
- Sales worldwide
- In-house EMS
- Developed & produced in Germany



ISO 9001:2015
(quality management)
certified



ISO 14001:2015
(environmental
management) certified

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cronologic

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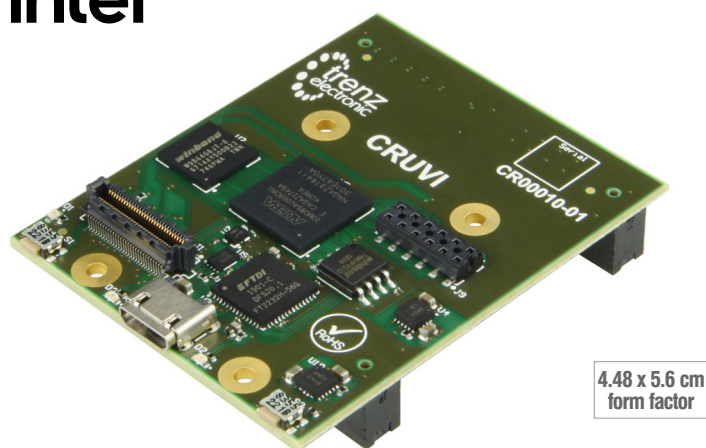
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NEW CR00010 CRUVI Series
Intel MAX 10 CRUVI Carrier, SDRAM, Flash, USB

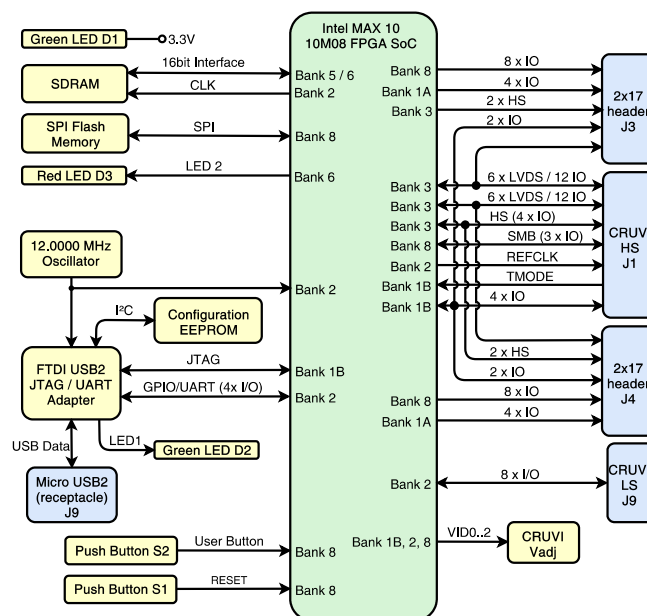


intel



4.48 x 5.6 cm
form factor

<http://trenz.org/cr00010-info>

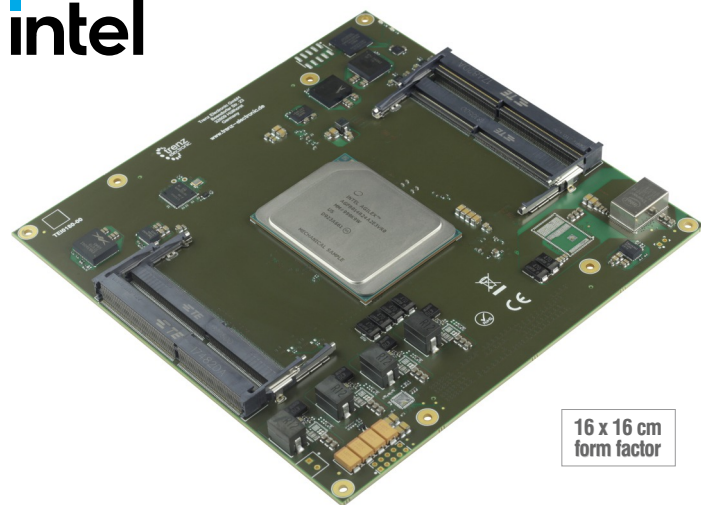


Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	Total I/O	Other Features
Altera 10M08SAU169C8G	CRUVI (1 x HS, 1 x LS), 2 x 34 Pin Header	8	8	24 + 32	USB2.0, user push buttons and LED

NEW TEI0180 Series
Intel Agilex F-Series, DDR4 SODIMM Memory Socket, Flash, Intel MAX 10 Controller

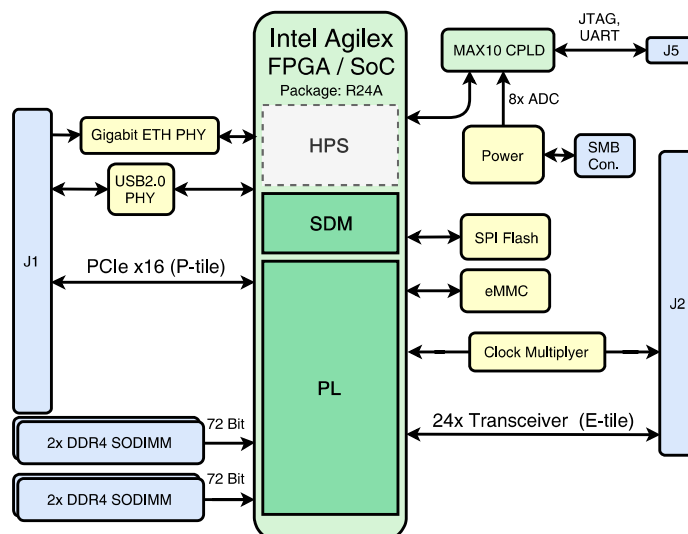


intel



16 x 16 cm
form factor

<http://trenz.org/tei0180-info>



Device list	Pin Package	Connectors	DDR4 SODIMM	Flash [MByte]	System Controller	Transceivers	Other Features
Intel Agilex F-Series AGFA014R24A3E3VR0	R24A 2486	2 x 400 pin Samtec	4 x	512	Intel MAX 10	16 + 24	PLL clock generator, optional (with Agilex including HPS): 1 GBit ETH-PHY, 8 GByte e.MMC, USB2.0 PHY

NEW TE0835 RFSoc Series

Xilinx Zynq UltraScale+ RFSoc, DDR4, Flash, Ethernet, USB, EEPROM

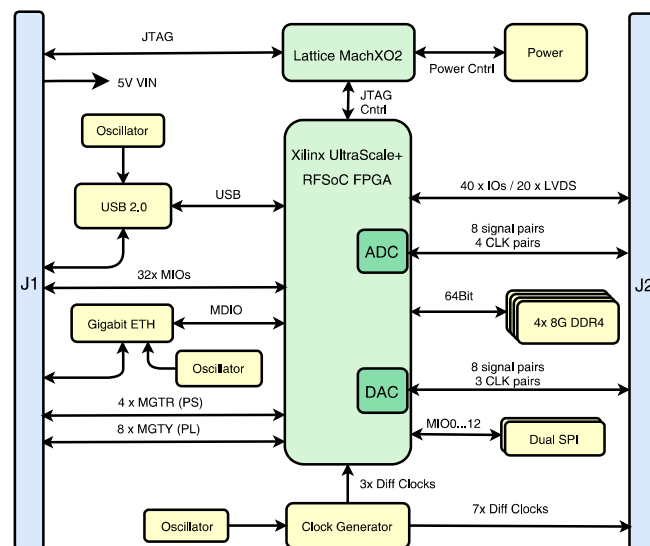


ZYNQ[®]
UltraSCALE⁺



6.5 x 9 cm
form factor

<http://trenz.org/te0835-info>



Device list	Pin Packages	Connectors	SDRAM [GByte]	Flash [MByte]	Ethernet PHY	Total I/O	Gbit Transceivers	Other Features
XCZU25DR-1FFVE1156E	E1156, speedgrade -1	2 x Samtec ST5	4 DDR4	128	Gigabit	40 x I/O/ 20 LVDS + 32 MIO	8 x GTY, 4 x GTR	USB2.0 OTG, MAC EEPROM

NEW TEB0912 Series

Xilinx Zynq UltraScale+ MPSoc with Firefly socket, 4 GB SDRAM on both PL and PS

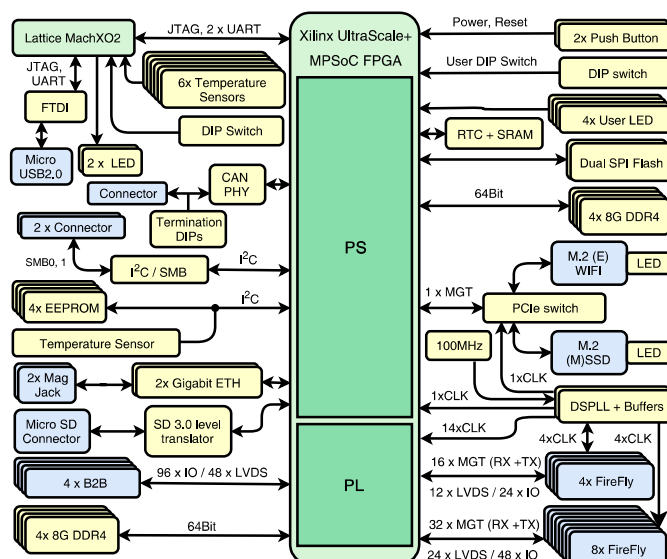


ZYNQ[®]
UltraSCALE⁺

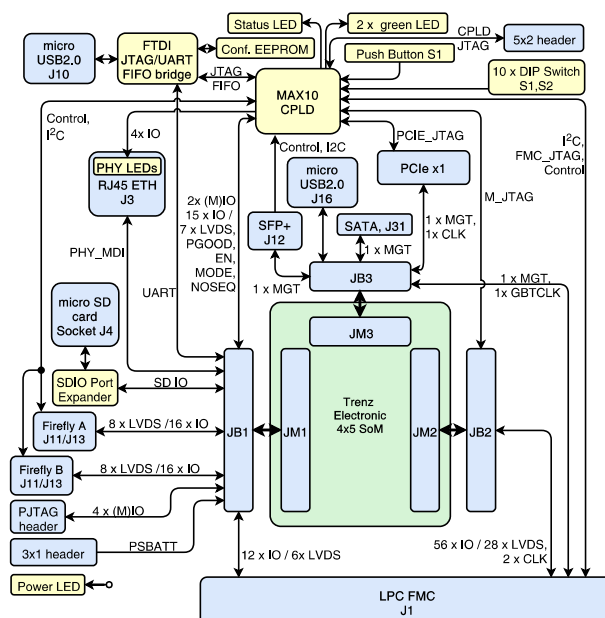


12 x 18 cm
form factor

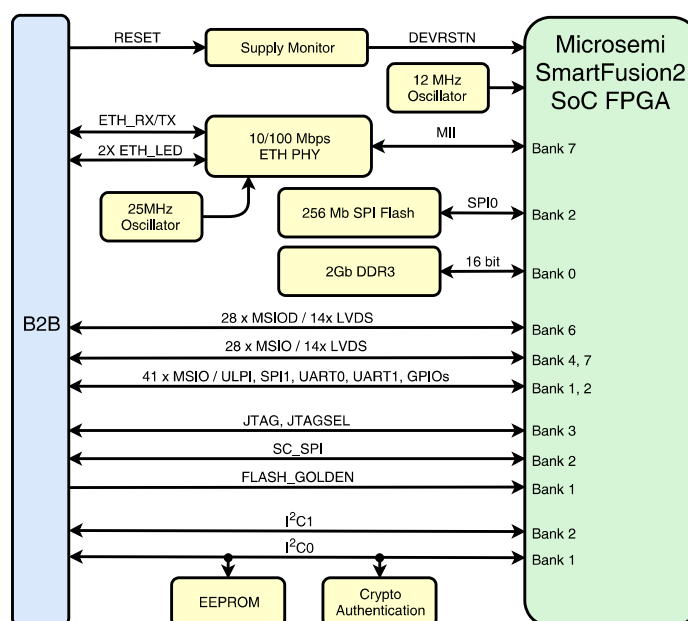
<http://trenz.org/teb0912-info>



Device list	Firefly sockets	SDRAM max [GByte]	Flash [MByte]	Ethernet	Header	Connectors	Other Features
Zynq UltraScale+ ZU11 - ZU19	4 x to GTY (copper/optical) 4 x for custom 8 lane JESD204B ADC 4 x for custom 8 lane JESD204B DAC	PS 4 DDR4 64 Bit, PL 4 DDR4 64 Bit	2 x 64	2 x RJ45 1 Gigabit	4x IDC for PL HD IO/LVDS	M2 PCIe SSD, M2 WAN/WLAN slot (PCIe/USB), Micro SD card (SD 3.0)	Onboard USB JTAG and UART, 2 x Si5395 low jitter PLL, single 12V input



PCle Carrier	Connectors	Other Features
For 4 x 5 cm modules	LPC FMC, SFP+, PCIe x1, SATA with pin 7 power configuration for SATADoM, RJ45 Gigabit Ethernet, micro USB to JTAG/UART bridge, 2 x 8 LVDS (FireFly), micro USB, micro SD card	MAX 10 CPLD, 4 x LED, module reset button, 10 x configuration/user dip switch



Device list	Connectors	SDRAM max [GBit]	Flash [MByte]	Ethernet PHY	Total I/O	Other Features
M2S010, supports up to M2S050	1 x Samtec ST5 160 pin	8 DDR3, optional DDR3L	32	100 Mbps	105	Optional crypto authentication device, serial EEPROM for MAC address, power supply monitor

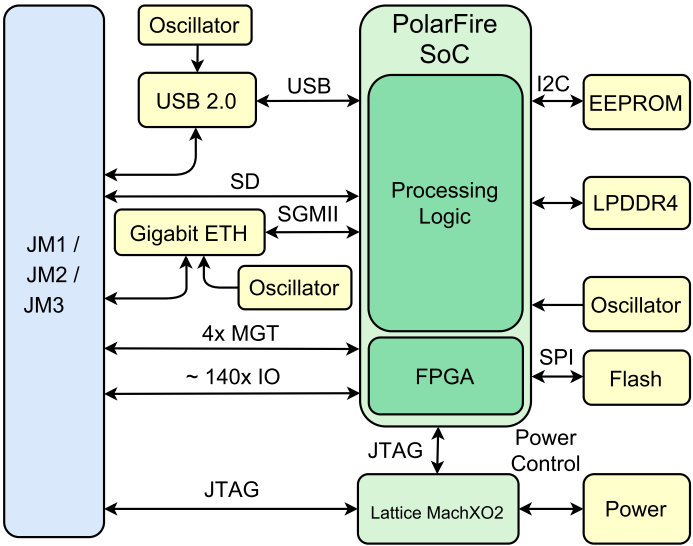
NEW TEM0007 Series

Microsemi PolarFire Multi-Core RISC-V SoC FPGA, LPDDR4, Flash, Ethernet, EEPROM



4 x 5 cm form factor

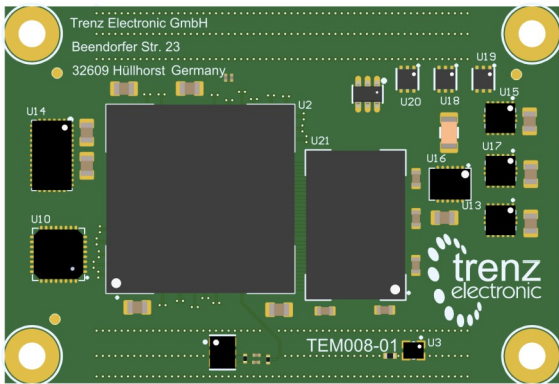
<http://trenz.org/tem0007-info>



Device list	Pin Package	Connectors	SDRAM max [GByte]	Flash [MByte]	Ethernet	Other Features
MPFS250T-1	FCVG484I	3 x Samtec LSHM	1 LPDDR4	64 MByte	1 GBit	EEPROM MAC address, USB2.0

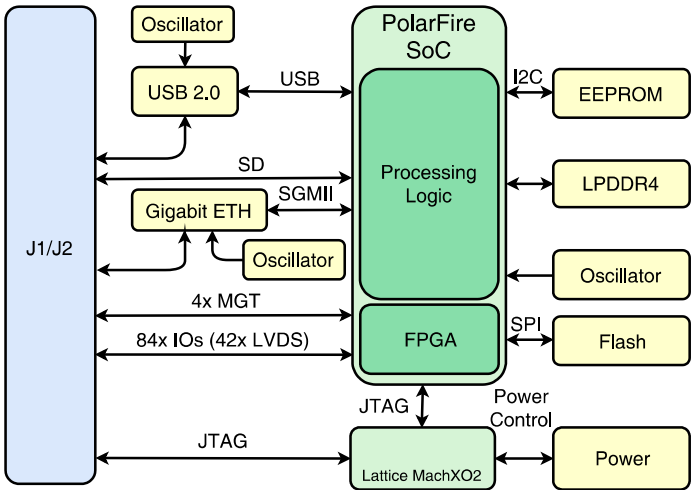
NEW TEM0008 Series

Microsemi PolarFire Multi-Core RISC-V SoC FPGA, LPDDR4, Flash, Ethernet, USB



3.8 x 5.6 cm form factor

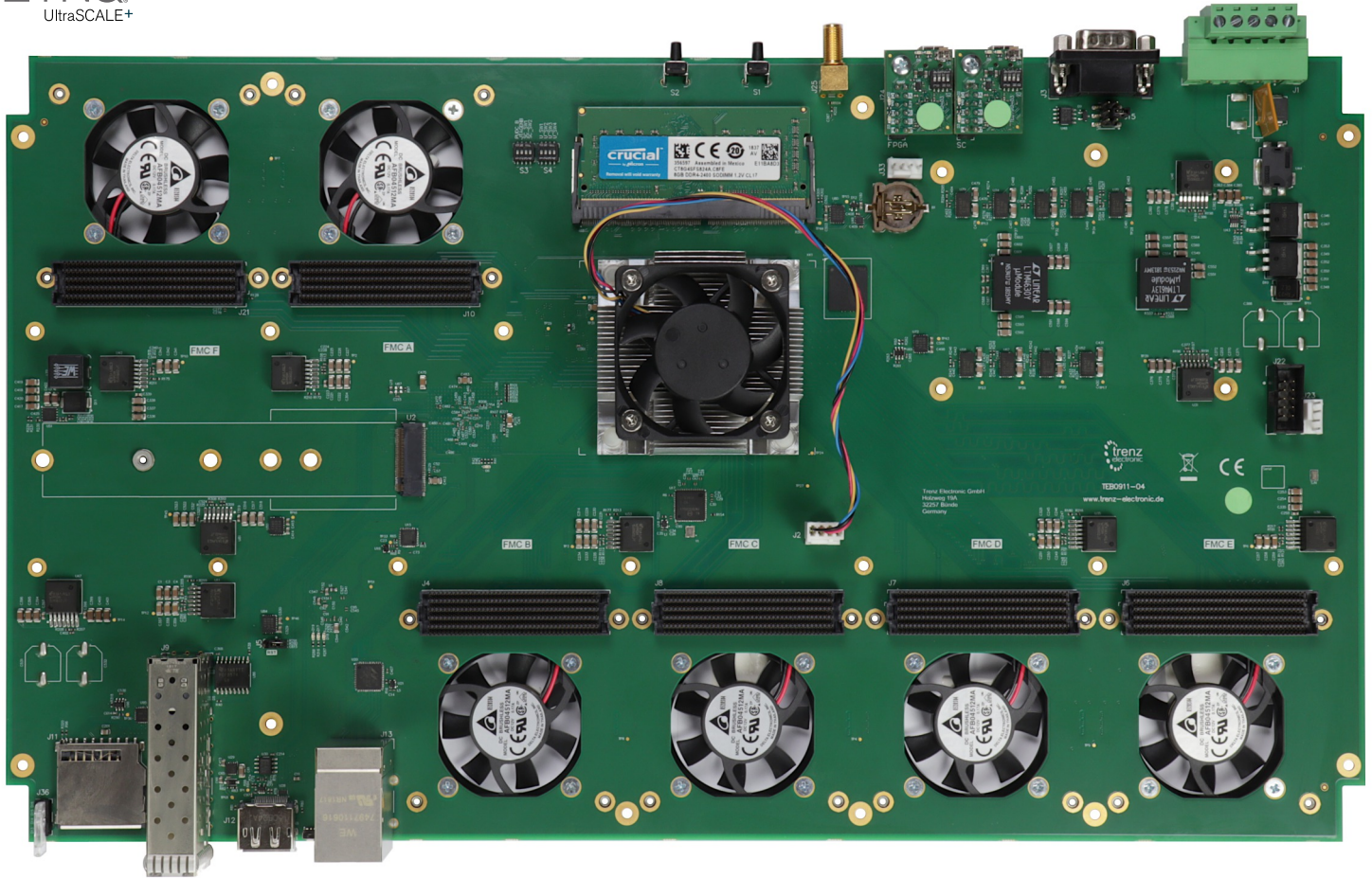
<http://trenz.org/tem0008-info>



Device list	Pin Package	Connectors	SDRAM max [GByte]	Flash [MByte]	Ethernet	Other Features
MPFS250T-1	FCVG484	2 x Samtec ADM6	1 LPDDR4	64 MByte	1 GBit	EEPROM MAC address, USB2.0

TEB0911 UltraRack+ Board

Xilinx Zynq UltraScale+, 6 FMC Slots, Gigabit Ethernet



Key Features

The TEB0911 UltraRack+ board is integrating a Xilinx Zynq UltraScale+ MPSoC with 4 GByte Flash memory for configuration and operation, DDR4-SDRAM SO-DIMM socket with 64-bit wide data bus, 22 MGT lanes and powerful switch-mode power supplies for all on-board voltages. The TEB0911 board exposes the pins of the Zynq MPSoC to accessible connectors and provides a whole range of on-board components to test and evaluate the Zynq UltraScale+ MPSoC and for developing purposes. The board is capable to be fitted to a enclosure, whereby on the enclosure's rear and front panel, I/O's, LVDS-pairs and MGT lanes are accessible through 6 on-board FMC connectors and other standard high-speed interfaces, namely USB3, SFP+, SSD, GbE, etc.

- Zynq UltraScale+ MPSoC
 - 1156 Pin Package
 - Assembly options: ZU6, ZU9, ZU15
- 64-bit DDR4 SODIMM (PS connected)
- M2 PCIe SSD (1-Lane)
- eMMC (bootable)
- Dual QSPI Flash (bootable)
- System controller (LCMX02-7000HC)
 - Power sequencing
 - IO expander
- Configurable PLLs
 - GTH/GTP reference CLKs

Front Panel

- 4 x FMC
 - 4 GTH per FMC
 - 68 ZynqMP PL IO per FMC
- DisplayPort (2-lanes)
- RJ45 ETH + dual USB3 combo
- Dual Stack SFP+
- SD (bootable)
- Status LEDs

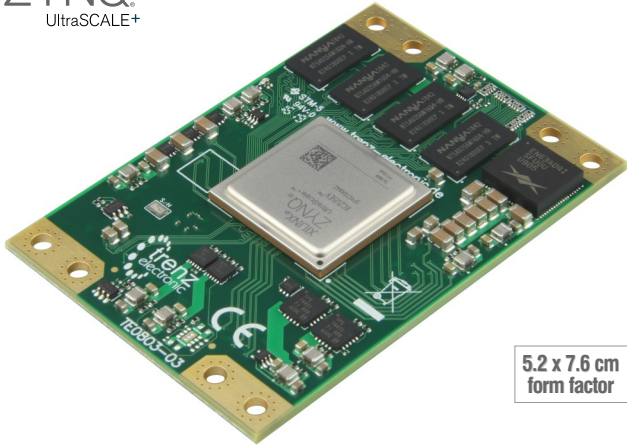
Back Panel

- 2 x FMC
 - 4/2 GTH
 - 12 ZynqMP PL IO per FMC
- 56 SC IO
- USB JTAG/UART ZynqMP
- USB JTAG/GPIO FMC
- CAN FD (DB9 connector)
- SMA (external CLK)
- 5-pin 24V power connector

Additional information

- 406 mm x 234.30 mm board size
- Other assembly options for cost or performance optimization plus high volume prices available on request.

TE0803 Series
Xilinx Zynq UltraScale+, DDR4, Flash, 8 High Speed Serial Transceivers



5.2 x 7.6 cm form factor

http://trenz.org/te0803-info

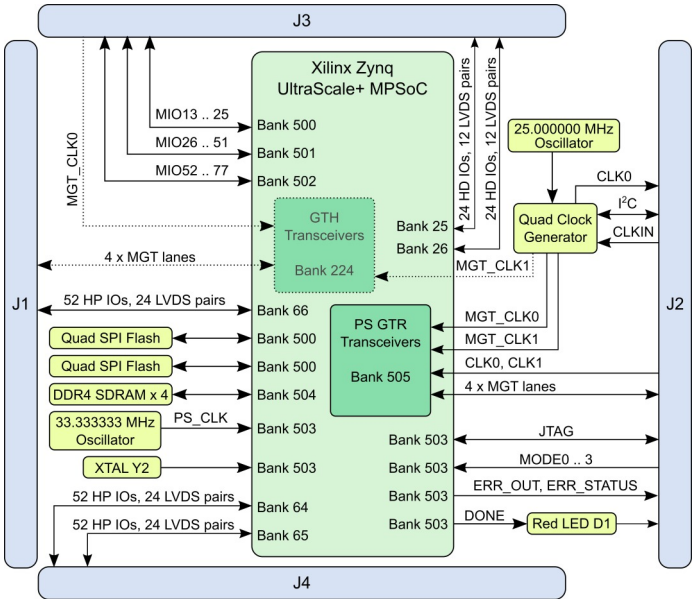
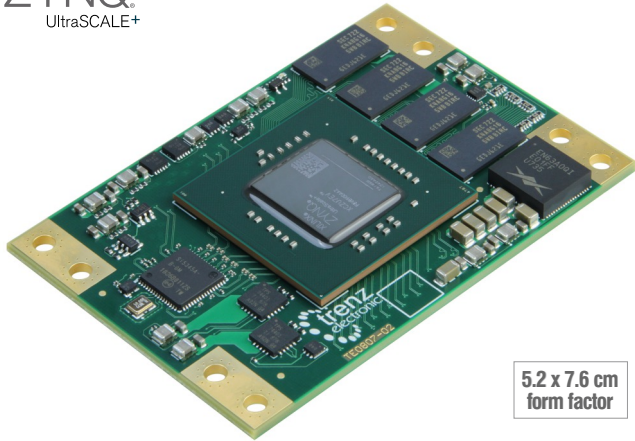


Table with 8 columns: Device list, Pin Packages, Connectors, SDRAM max [GByte], Flash [MByte], Total I/O, GBit Transceivers, Other Features. It lists specifications for ZU2CG to ZU5EV devices.

TE0807 Series
Xilinx Zynq UltraScale+, DDR4, Flash, 20 High Speed Serial Transceivers



5.2 x 7.6 cm form factor

http://trenz.org/te0807-info

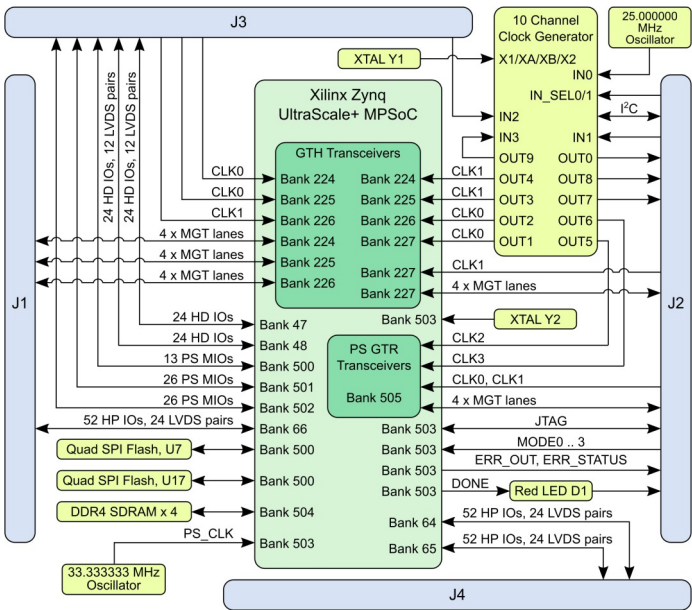
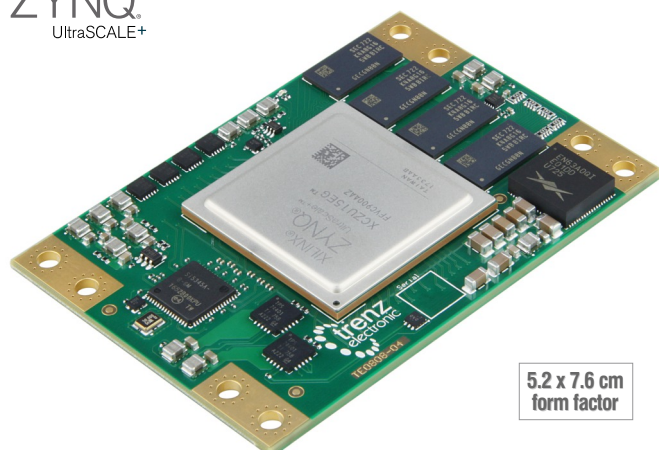


Table with 8 columns: Device list, Pin Package, Connectors, SDRAM max [GByte], Flash [MByte], Total I/O, GBit Transceivers, Other Features. It lists specifications for ZU4CG to ZU7EV devices.

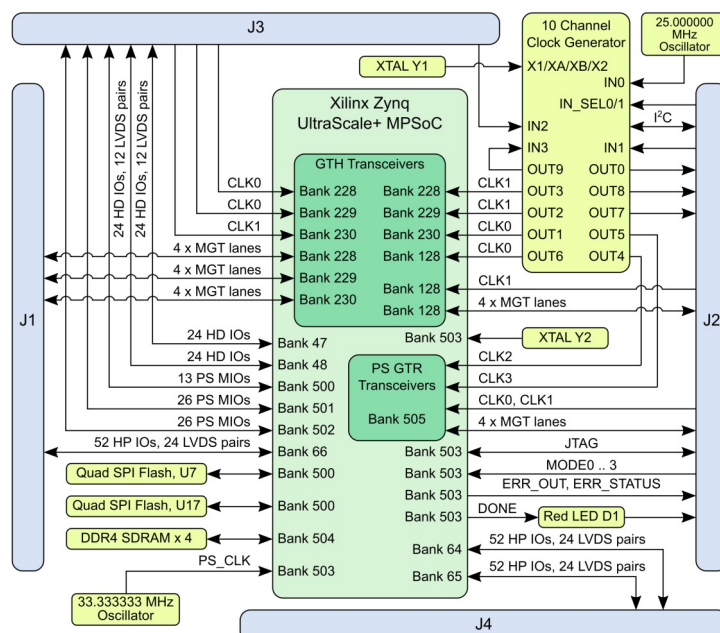
Xilinx Zynq UltraScale+, DDR4, Flash, 20 High Speed Serial Transceivers

ZYNQ
UltraSCALE+



**5.2 x 7.6 cm
form factor**

<http://trenz.org/te0808-info>



Device list	Pin Package	Connectors	SDRAM max [GByte]	Flash [MByte]	Total I/O	GBit Transceivers	Other Features
ZU6CG, ZU9CG, ZU6EG, ZU9EG, ZU15EG	C900	4 x Samtec ST5	8 DDR4	128	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply

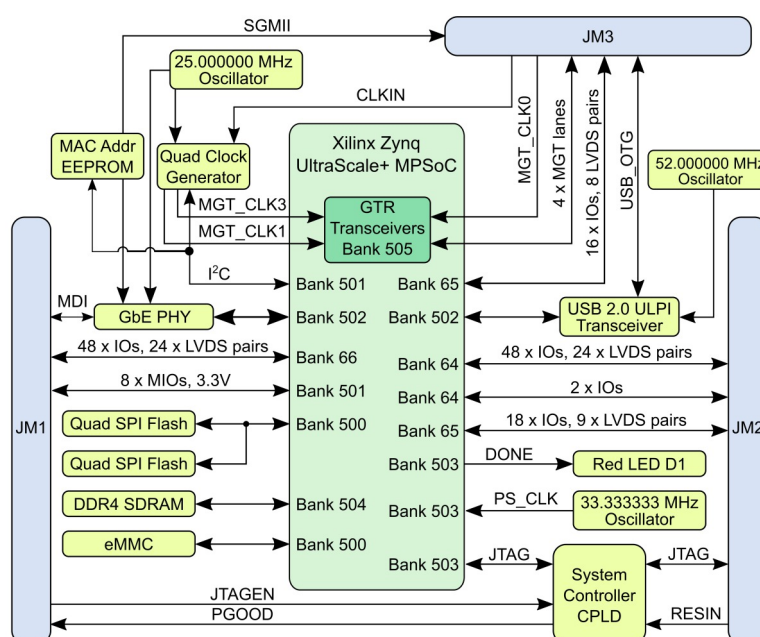
TE0820 Series

Xilinx Zynq UltraScale+, DDR4, Flash, USB, Ethernet, eMMC



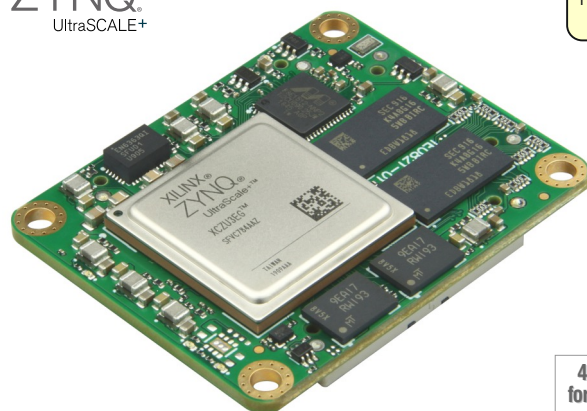
4 x 5 cm
form factor

<http://trenz.org/te0820-info>



Device list	Pin Packages	Connectors	SDRAM max [GByte]	Flash [MByte]	e.MMC [GByte]	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	4 DDR4	128	4 - 64	1 GBit	USB2.0 OTG	132 + 14 MIO	4 x PS GTR	GPU/VCU depending on device, programmable clock generator, single supply

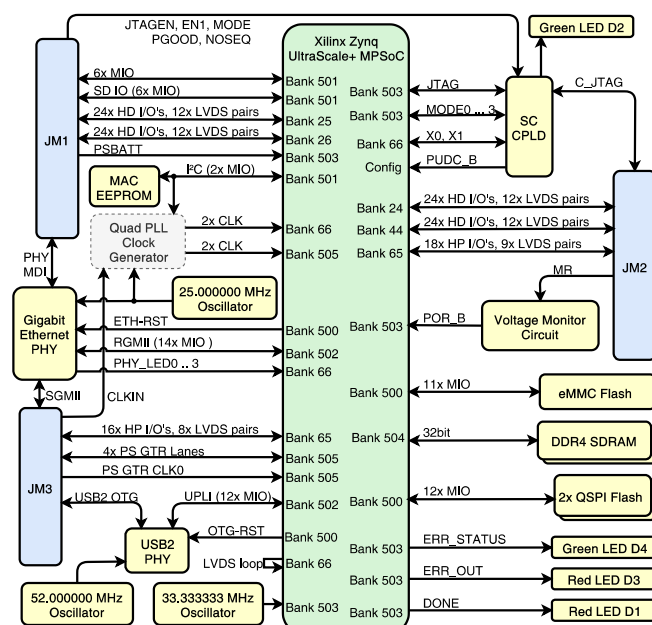
ZYNQ
UltraSCALE+



Pin compatible
with TE0820

4 x 5 cm
form factor

<http://trenz.org/te0821-info>



Device list	Pin Packages	Connectors	SDRAM max [GByte]	Flash [MByte]	e.MMC [GByte]	Ethernet PHY	USB PHY	Total I/O	GBit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	4 DDR4	128	8 64 max.	1 GBit	USB2.0 OTG	34 x HP 96 x HD 14 MIO	4 x PS GTR	GPU/VCU depending on device, programmable clock generator, single supply

NEW TE0823 Series

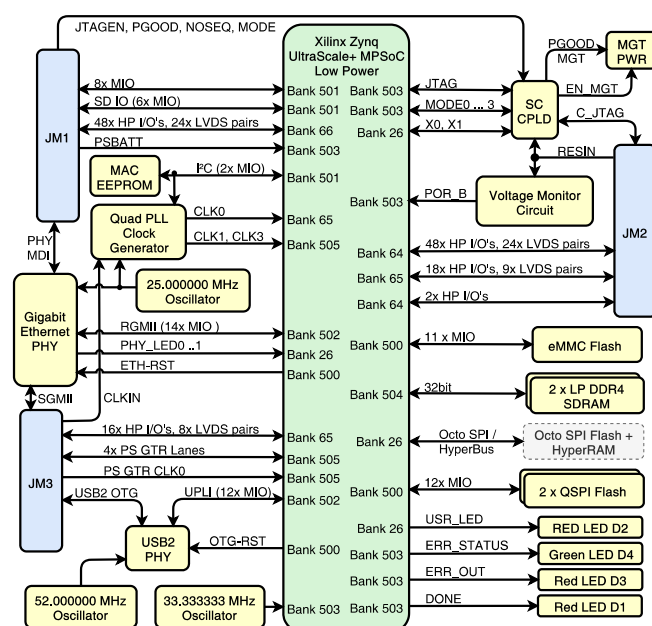
ZYNQ
UltraSCALE+



Optional HyperRAM/
OctalRAM/HyperFlash/
xSPI Flash

4 x 5 cm
form factor

<http://trenz.org/te0823-info>



Device list	Pin Packages	Connectors	SDRAM max [GByte]	Flash [MByte]	eMMC [GByte]	Ethernet PHY	USB PHY	Total I/O	GBit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	2 LPDDR4	128	8 - 64	1 GBit	USB2.0 OTG	132 HP + 14 MIO	4 x PS GTR	GPU/VCU depending on device, programmable clock generator, single supply



The diagram illustrates the Xilinx Zynq UltraScale+ SoC architecture and its connections to various external components. The central SoC is divided into three main functional blocks: PL (Programmable Logic), PS (Processing System), and PS MGTs (Phase-Locked Loop Management and Timing Resources).

Internal SoC Components:

- PL (Programmable Logic):** Contains six configuration banks: Bank 26, Bank 65, Bank 66, Bank 503, Bank 504, and Bank 500.
- PS (Processing System):** Contains three configuration banks: Bank 502 and Bank 501.
- PS MGTs (Phase-Locked Loop Management and Timing Resources):** Located at the bottom of the PS block.

External Peripherals and Connections:

- Oscillators:**
 - 12 MHz, U19 (connected to micro USB J10)
 - 33 MHz, U15 (connected to 4x Dip Switch, S9)
 - 25 MHz, U7 (connected to Clock Generator CDCI6214, U8)
 - 25 MHz, U7 (connected to ETH PHY 88E1512, U6)
- Memory and Storage:**
 - EEPROM U16 (connected to micro USB J10 and 4x Dip Switch, S9)
 - 4x Dip Switch, S9
 - DDR4 U13
 - micro SD Card, J9
 - Grove Con. J10
 - ETH PHY 88E1512, U6
 - USB PHY USB3320, U22
 - EEPROM U2
 - RJ45 J4
- Input/Output (IO) and Control:**
 - 16 x IO (connected to Pmods J5, J6)
 - 4 Digit 7 Segment Display, D9
 - 5 x Push Button
 - 8 x Switch
 - 8 x LED red
 - 3.5mm earphone jack, J12
 - VGA J7
 - 1x4 Pin header, J14
 - 1 x CLK (connected to Clock Generator CDCI6214, U8)
 - 3 x CLK (connected to Clock Generator CDCI6214, U8)
- Communication and Interfacing:**
 - FTDI FT2232H, U14 (connected via UART and JTAG)
 - USB3 A J11
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
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 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3
 - M.2 Connector Key M, PCIe x1
 - USB B3 A J11
 - USB PHY USB3320, U22
 - ETH PHY 88E1512, U6
 - micro SD Card, J9
 - Grove Con. J10
 - DDR4 U13
 - EEPROM U16
 - 4x Dip Switch, S9
 - 12 MHz, U19
 - 33 MHz, U15
 - 25 MHz, U7
 - 25 MHz, U7
 - EEPROM U2
 - RJ45 J4
 - USB PHY USB3320, U22
 - Display Port Source J3

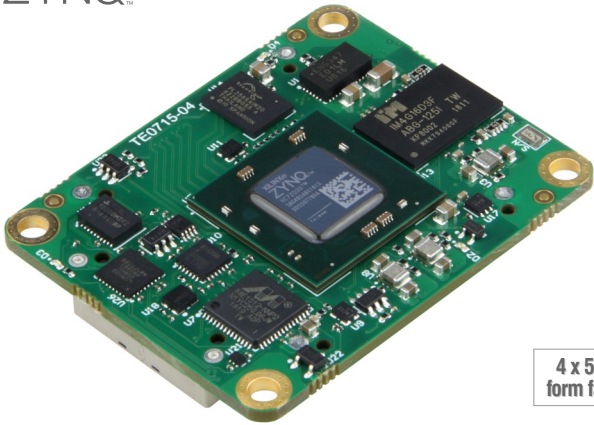
Device list	SDRAM max [GByte]	Flash [MByte]	Ethernet RJ45	USB	User I/O	Audio	Other Features
ZU2CG	2 LPDDR4	32	1 GBit	USB3.0 Host (type A connector)	2 Pmod connectors	3.5 mm jack (PWM output)	EEPROM, USB JTAG/UART MicroUSB, Micro SD card, M2 PCIe SSD support, display, power: 5V Plug

[illegible]

Device list	Form Factor	DDR4 SODIMM [GByte]	Flash [MByte]	USB	Total I/O	Ethernet	Gbit Transceivers	Other Features
ZU15EG, 1156 Pin Packages	3U	8 (32 max.)	512 max.	USB3.0	32 x differential pairs	1 Gigabit	24 on PL side 4 on PS side	JTAG/UART via MicroUSB, 2 x EEPROM real time clock, Zynq MPSoC cooling fan connector

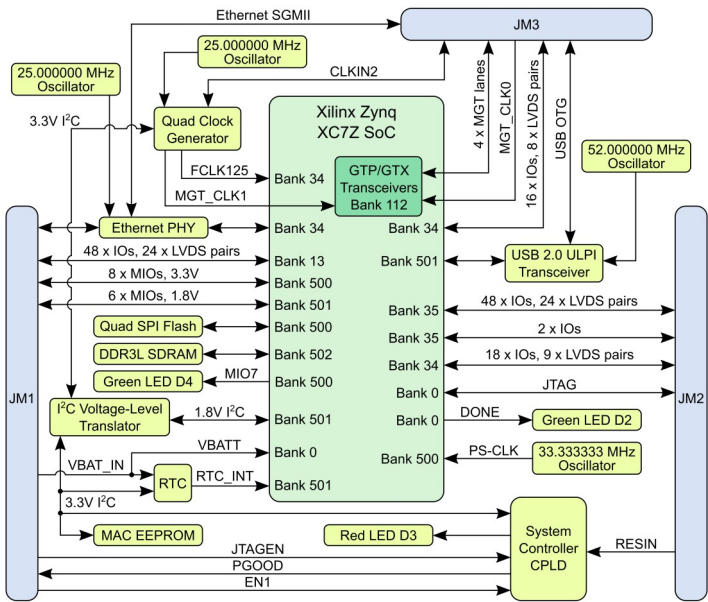
TE0715 Series

Xilinx Zynq-7000, DDR3, Flash, Ethernet, USB, 4 High Speed Serial Transceivers



4 x 5 cm form factor

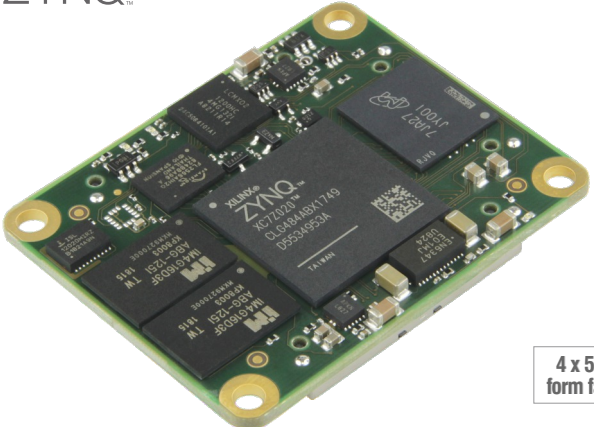
http://trenz.org/te0715-info



Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	Ethernet PHY	USB PHY	Total I/O	GBit Transceivers	Other Features
Z-7015, Z-7030, Z-7012S	3 x Samtec LSHM	1 DDR3	32	1 GBit	USB2.0	132 + 14 MIO	Z-7015: 4 x GTP Z-7030: 4 x GTX	Programmable clock generator, real time clock, single supply

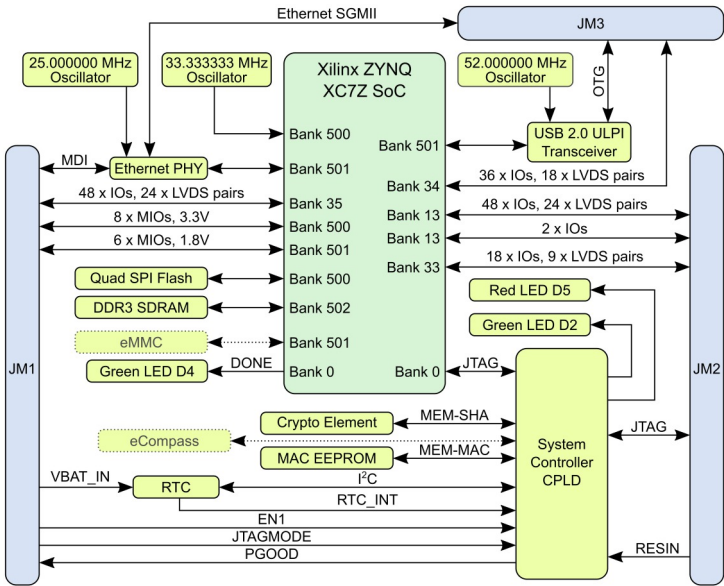
TE0720 GigaZee Series

Xilinx Zynq-7000, DDR3, Flash, Ethernet, USB, e.MMC, Automotive Grade available



4 x 5 cm form factor

http://trenz.org/te0720-info

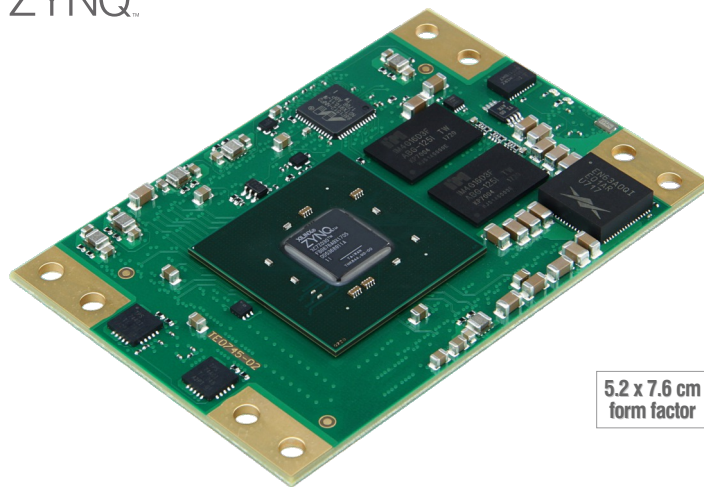


Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	e.MMC max. [GByte]	Ethernet PHY	USB PHY	Total I/O	Other Features
Z-7020, Z-7014S, XA7Z020-1CLG484Q	3 x Samtec LSHM	1 DDR3	32	32	1 GBit	USB2.0	152 + 14 MIO	Real time clock, MAC address, 2k serial EEPROM, 3 user LEDs, single supply

TE0745 Series

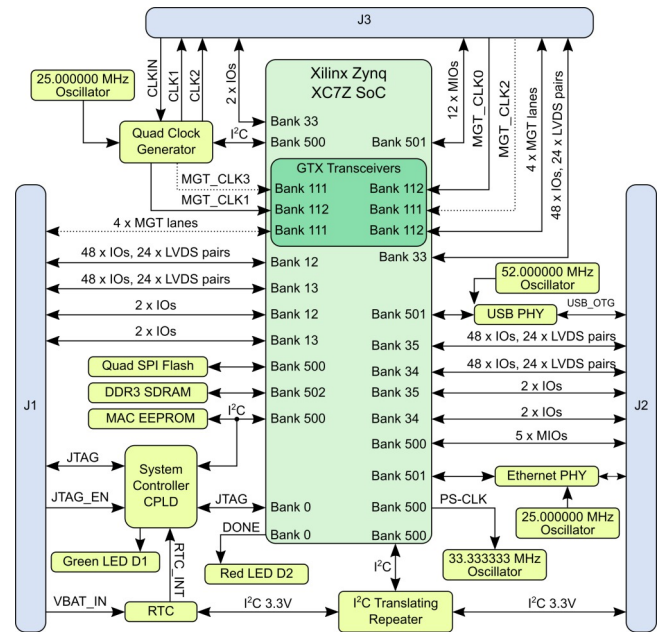
Xilinx Zynq-7000, DDR3L, Flash, USB, Ethernet, 8 x GTX

ZYNQ™



5.2 x 7.6 cm
form factor

<http://trenz.org/te0745-info>

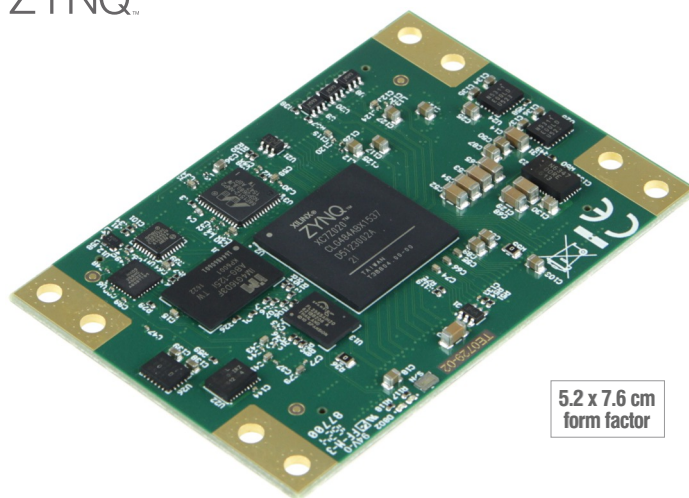


Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	Ethernet PHY	USB PHY	Total I/O	Gbit Transceivers	Other Features
Z-7030, Z-7035, Z-7045	3 x Samtec ST5	1 DDR3L	64	1 Gbit	USB2.0 OTG	250 + 6 MIO	8 x GTX	Real time clock, single supply

TE0729 Series

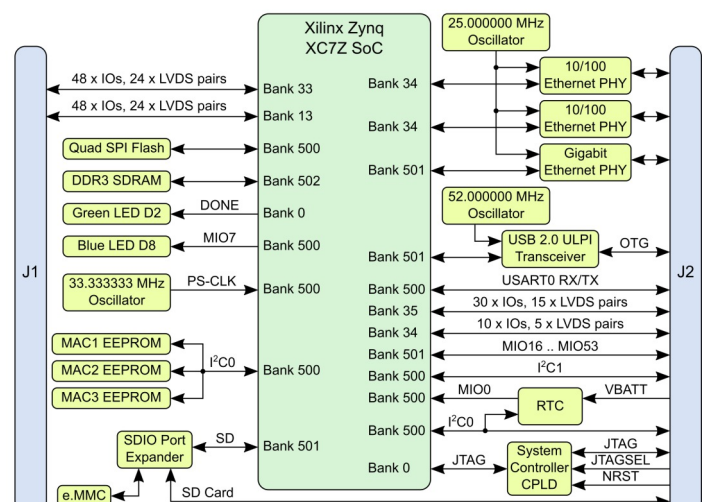
Xilinx Zynq-7000, DDR3, Flash, 3 x Ethernet, 3 x EEPROM, USB, e.MMC

ZYNQ™



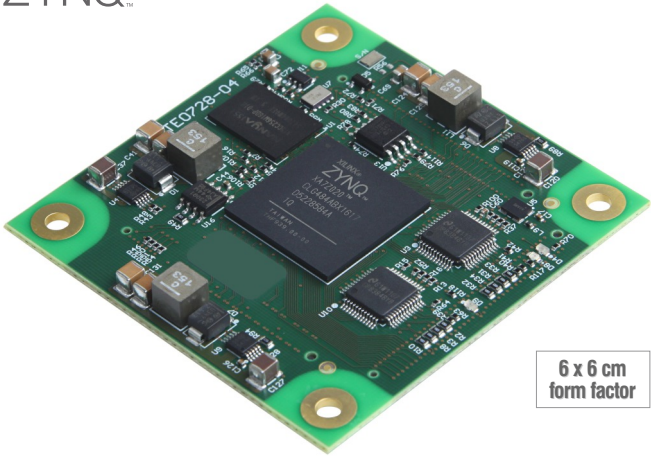
5.2 x 7.6 cm
form factor

<http://trenz.org/te0729-info>

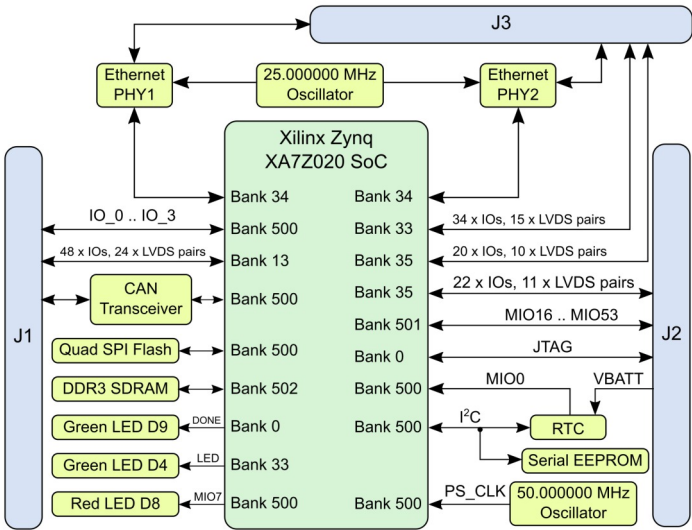


Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	e.MMC [GByte]	Ethernet PHY	USB PHY	EEPROM	Total I/O	Other Features
Z-7020	3 x Samtec LSHM	512 DDR3	32	4 - 64	2 x 100 MBit, 1 Gbit	USB2.0 OTG	2 x MAC address	136 + 14 MIO	Real time clock, single supply

TE0728 Series
Xilinx Zynq-7000, DDR3, Flash, 2 x Ethernet, CAN, Automotive



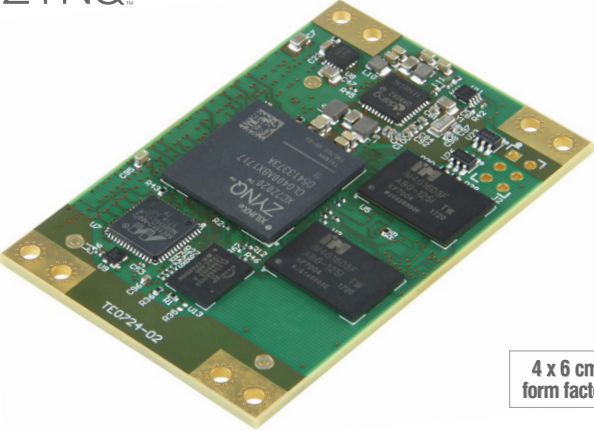
6 x 6 cm
form factor



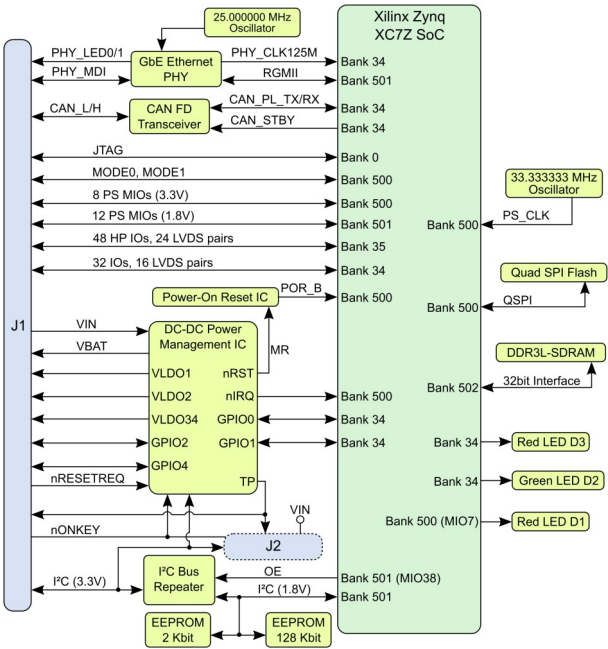
<http://trenz.org/te0728-info>

Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	EEPROM	Ethernet PHY	Total I/O	Other Features
XA7Z020 (automotive)	3 x Samtec SEM	512 DDR3	16	8 KByte	2 x 100 MBit	124 + 30 MIO	Automotive, real time clock, CAN, single supply

TE0724 Series
Xilinx Zynq-7000, DDR3L, Flash, Ethernet, EEPROM, CAN



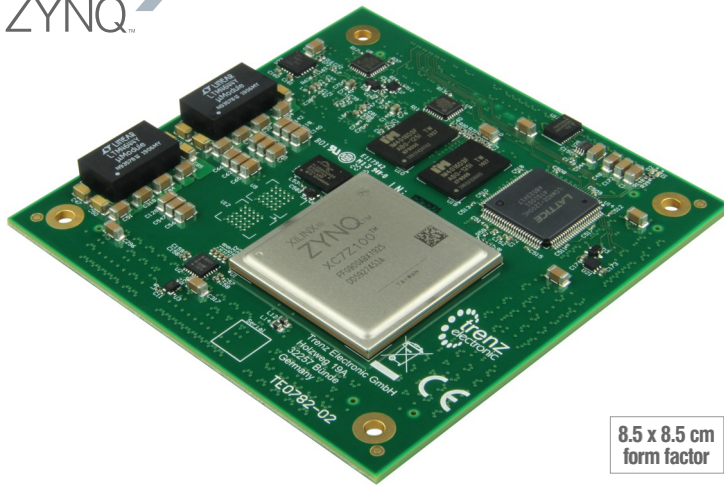
4 x 6 cm
form factor



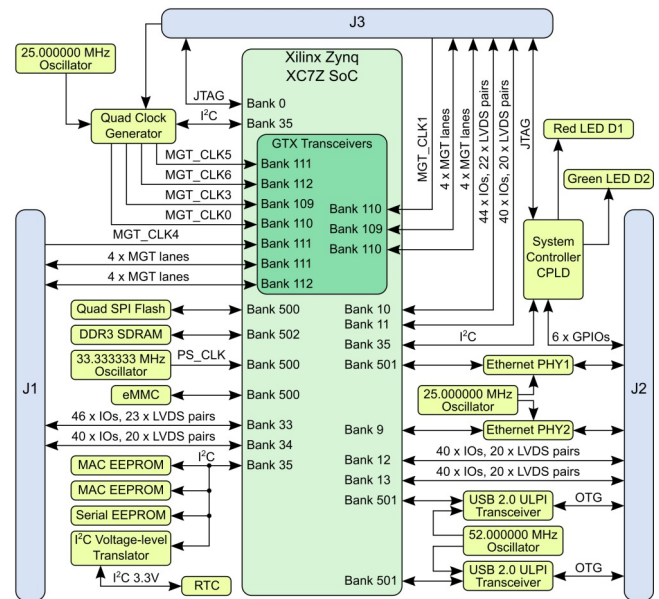
<http://trenz.org/te0724-info>

Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	EEPROM	Ethernet PHY	Total I/O	Other Features
Z-7010, Z-7020	1 x Samtec ST5	1 DDR3L	32	MAC Address	1 GBit	PL: 80 PS: 20	CAN, single supply

Xilinx Zynq-7000, DDR3, Flash, 2 x GBit Ethernet, 2 x USB, eMMC, 16 x Transceivers



<http://trenz.org/te0782-info>

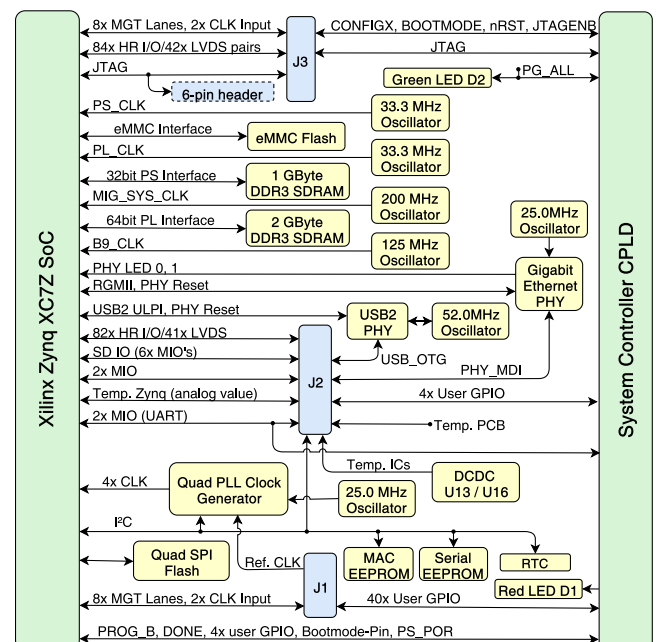


Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	e.MMC [GByte]	Ethernet PHY	USB PHY	Total I/O	GBit Transceivers	Other Features
Z-7035, Z-7045, Z-7100	3 x Samtec QTH	1 DDR3	32	4 - 64	2 x 1 GBit	2 x USB2.0 OTG	250 + 2 MIO	16 x GTX	Programmable clock generator, real time clock, single supply

Xilinx Zynq-7000, Memory on both PS and PL, Flash, Ethernet, USB, eMMC



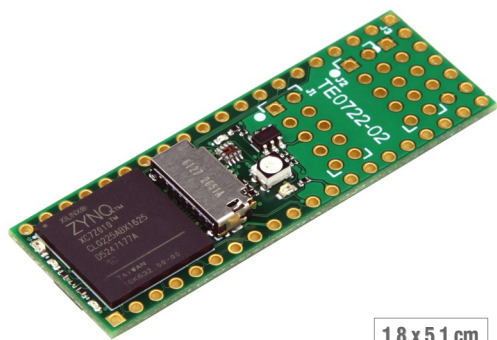
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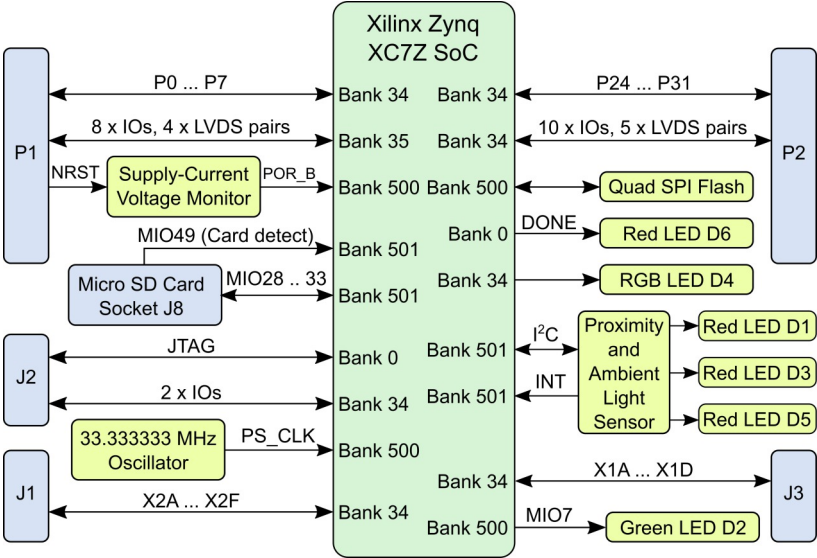
Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	e.MMC [GByte]	Ethernet PHY	Total I/O	GBit Transceivers	Other Features
Z-7035, Z-7045, Z-7100	3 x Samtec QTH	1 DDR3 32-bit connected to PS plus 2 DDR3 64-bit connected to PL	32	4 max. 64	1 Gigabit	166	16 x GTX 4 x GT	USB2.0 OTG, programmable clock generator, real time clock, single supply

TE0722 DIPFORTy1 "Soft Propeller" Series

Xilinx Zynq-7000, Flash, fits on DIP40 Pinout, Parallax Propeller Chip compatibility



1.8 x 5.1 cm
form factor

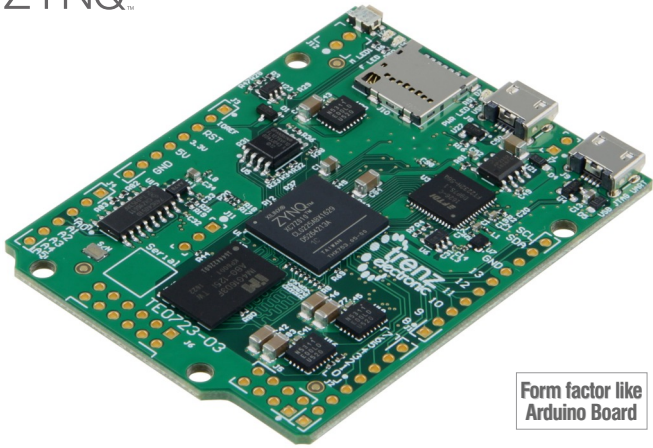


<http://trenz.org/te0722-info>

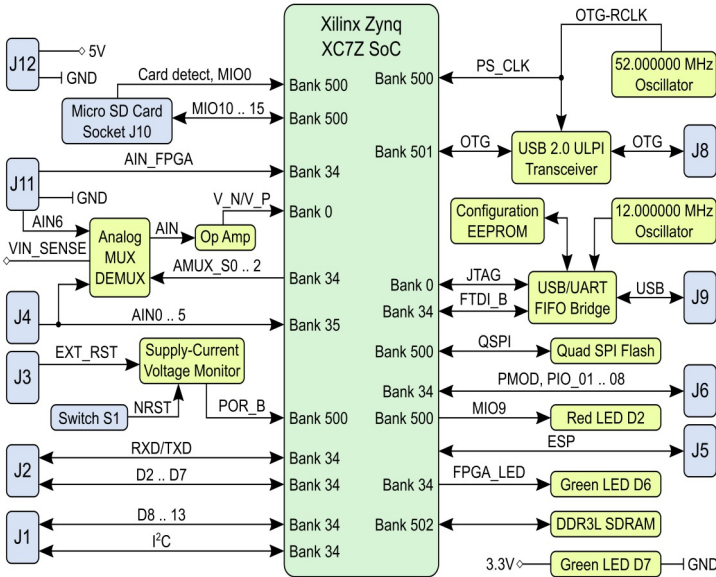
Device list	Flash [MByte]	Total I/O	DIP40 form factor	Clock	Other Features
Z-7010, Z-7007S	16	46 +3 Input only	2 x 20 holes for socket pins or pin-header	33.333 MHz (MEMS Oscillator)	3.3V single supply, micro SD card socket, proximity and ambient light sensor, industrial temperature range available

TE0723 "ArduZynq" Series

Xilinx Zynq-7000, DDR3L, Flash, USB OTG, On-board USB JTAG and UART



Form factor like
Arduino Board



<http://trenz.org/te0723-info>

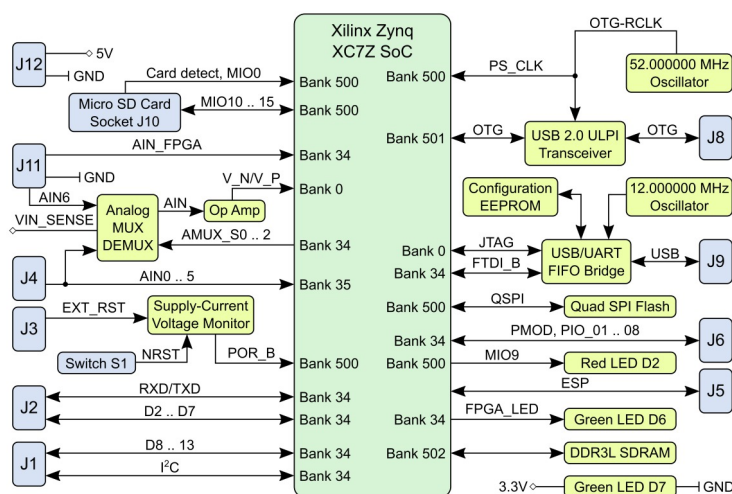
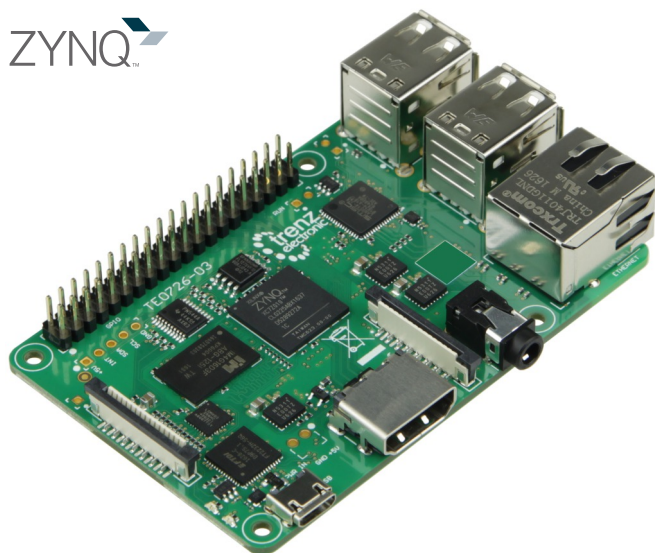
Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	USB PHY	Total I/O	Other Features
Z-7010, Z-7007S	Arduino Pmod headers	512 DDR3L	16	Micro USB OTG, micro USB, FT2232, JTAG/UART/FIFO	30	Micro SD, on-board USB JTAG and UART

TE0726 "ZynqBerry" Series

Xilinx Zynq-7000, Raspberry Pi 2 Form Factor, DDR3L, Flash, Ethernet, USB, HDMI



ZYNQ™



<http://trenz.org/te0726-info>

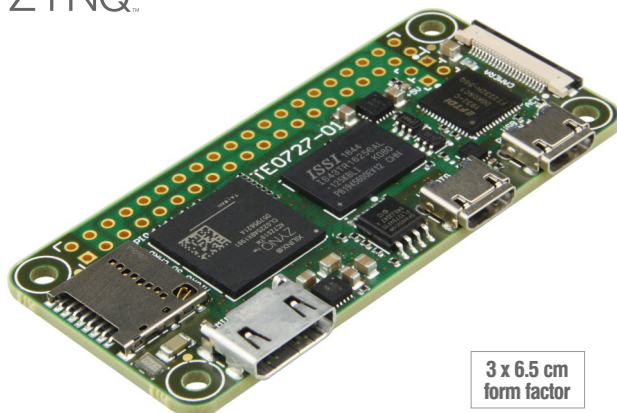
Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	Ethernet PHY	USB PHY	Total I/O	Other Features
Z-7010, Z-7007S	40-pin "HAT" headers	512 DDR3L	16	100 MBit	4 x USB2.0 Host	26	DSI display connector, CSI-2 camera connector, micro SD card slot, 3.5 mm audio plug, HDMI type A

NEW TE0727 "ZynqBerryZero" Series

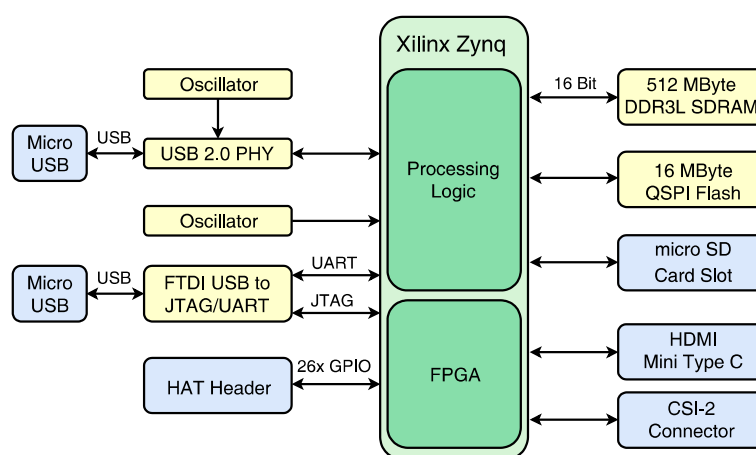
Xilinx Zynq-7000, Raspberry Pi Zero Form Factor, DDR3L, Flash, USB, mini HDMI



ZYNQ™



3 x 6.5 cm form factor



<http://trenz.org/te0727-info>

Device list	SDRAM max [MByte]	Flash [MByte]	HAT header	Total I/O	Other Features
Z-7010	512 DDR3L	16	40 pin	26 GPIO	2 x micro USB2.0, micro SD card slot, Mini HDMI type C, CSI-2 connector (camera)

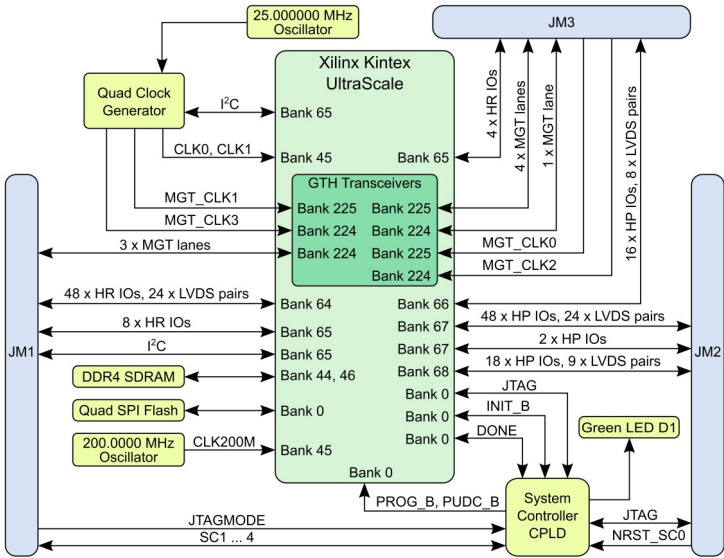
TE0841 Series

Xilinx Kintex UltraScale, DDR4, Flash, 8 x GTH Transceiver Lanes



4 x 5 cm form factor

http://trenz.org/te0841-info



Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	Total I/O	Gbit Transceivers	Other Features
KU035, KU040	3 x Samtec LSHM	4 DDR4	64	60 x HR I/Os 84 x HP I/Os	8 x GTH	Programmable clock generator, single supply

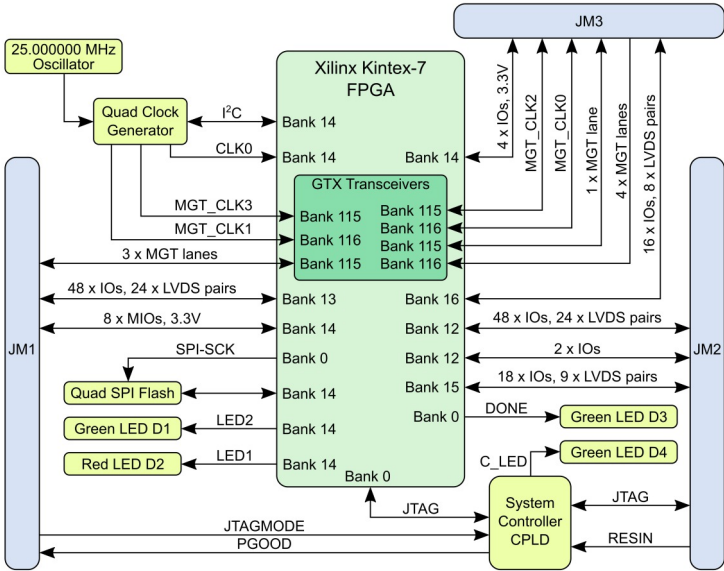
TE0741 Series

Xilinx Kintex-7, Flash, 8 High Speed Serial Transceivers, 25 MHz Oscillator



4 x 5 cm form factor

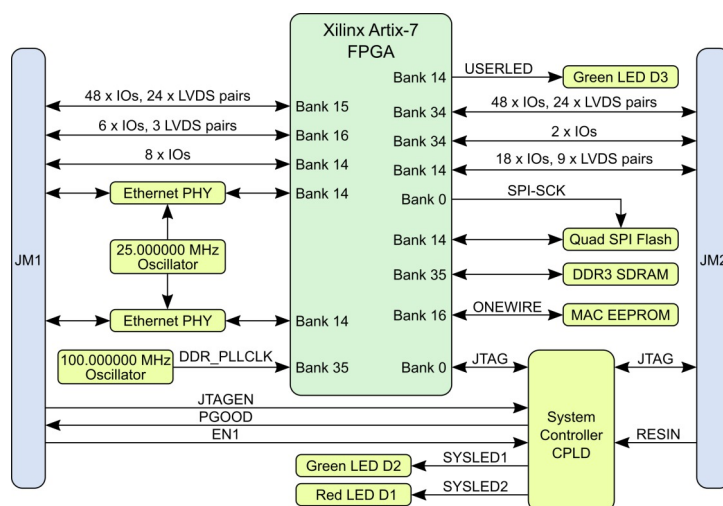
http://trenz.org/te0741-info



Device list	Connectors	Flash [MByte]	Total I/O	Gbit Transceivers	Other Features
70T, 160T, 325T, 410T	3 x Samtec LSHM	32	144 (94 for 70T variant)	8 x MGTs	Programmable clock generator, single supply

Xilinx Artix-7, DDR3, Flash, 2 x 100 MBit Ethernet, EEPROM

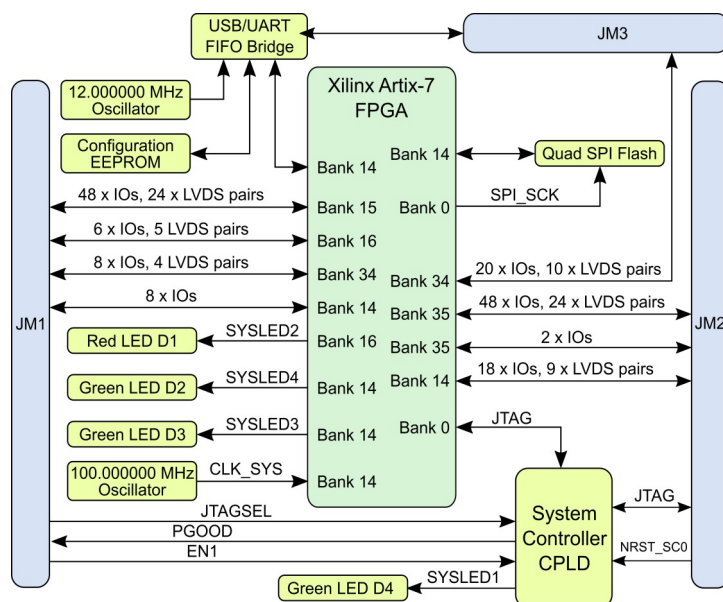
**4 x 5 cm
form factor**



Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	Ethernet PHY	Total I/O	Other Features
35T, 50T, 75T, 100T	2 x Samtec LSHM	512 DDR3	32	2 x 100 MBit	112 (51 differential pairs + 10 single-ended)	JTAG, 100 MHz MEMS oscillator, user LED, single supply

Xilinx Artix-7, Flash, USB, FTDI USB to UART/FIFO bridge, high pin count

**4 x 5 cm
form factor**



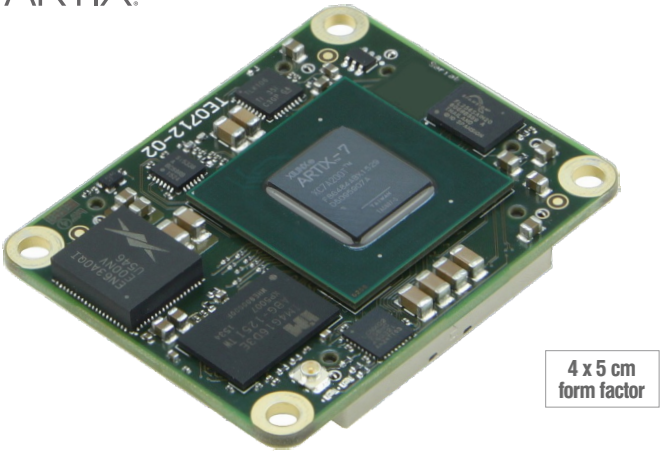
Device list	Connectors	Flash [MByte]	MEMS Oscillator	USB PHY	Total I/O	Other Features
35T, 50T, 75T, 100T	3 x Samtec LSHM	32	100 MHz	USB2.0 UART/FIFO	178 (84 differential pairs)	4 LEDs, single supply

TE0712 Series

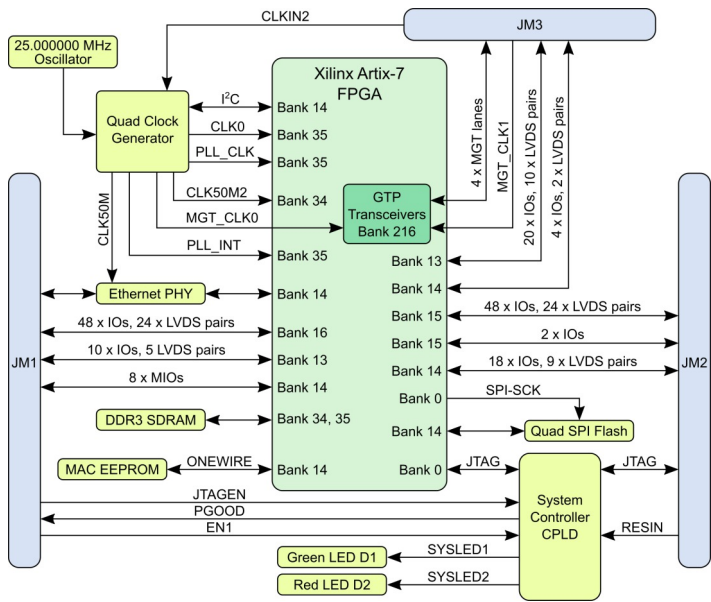
Xilinx Artix-7, DDR3, Flash, 100 MBit Ethernet, 4 x GTP Transceiver



ARTIX⁷



<http://trenz.org/te0712-info>



Device list	Connectors	SDRAM max [MByte]	Flash [MByte]	EEPROM	Ethernet PHY	Total I/O	GBit Transceivers	Other Features
35T, 50T, 75T, 100T, 200T	3 x Samtec LSHM	1024 DDR3	32	MAC Address	100 MBit	158	4 x GTP	Programmable clock generator, single supply

TE0713 Series

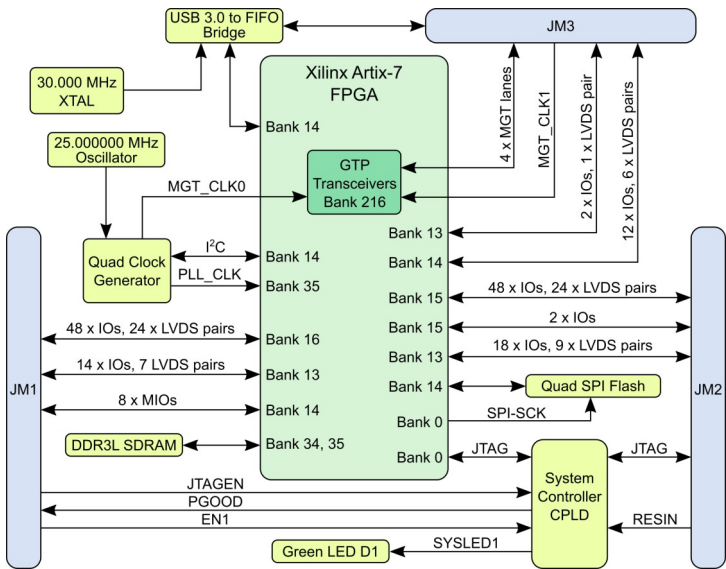
Xilinx Artix-7, DDR3L, Flash, USB3.0 to FIFO Bridge, 4 x GTP Transceiver



ARTIX⁷



<http://trenz.org/te0713-info>



Device list	Connectors	SDRAM max [GByte]	Flash [MByte]	USB PHY	Total I/O	GBit Transceivers	Other Features
15T - 200T	3 x Samtec LSHM	1 DDR3L	32	USB3.0	152	4 x GTP	Programmable clock generator, single supply

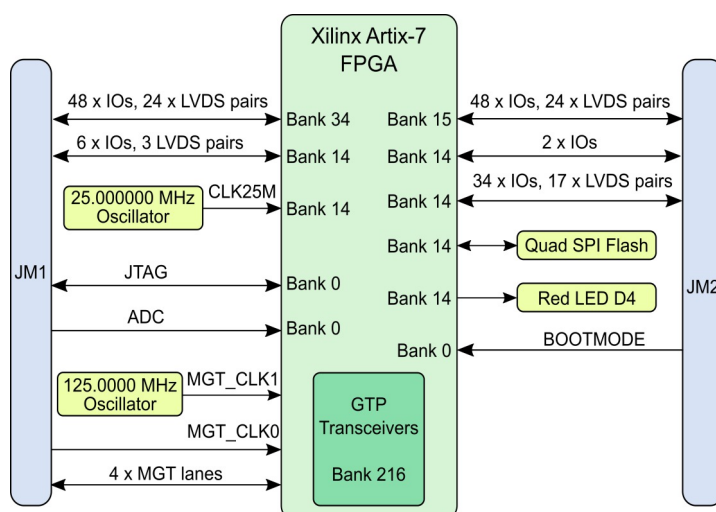
TE0714 Series

Xilinx Artix-7, Flash, 4 x GTP Transceiver, Form Factor 3 x 4 cm only

ARTIX⁷



3 x 4 cm
form factor



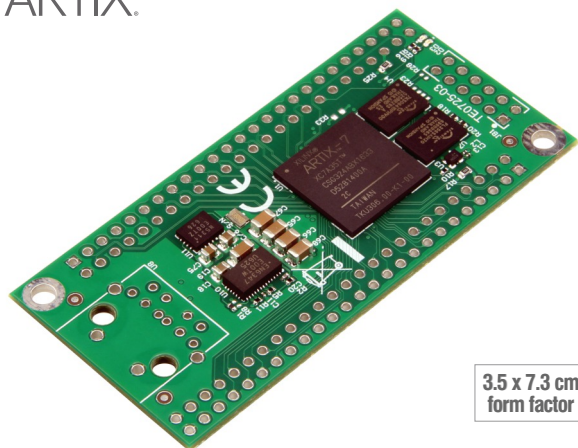
<http://trenz.org/te0714-info>

Device list	Connectors	Flash [MByte]	Total I/O	GBit Transceivers	Other Features
15T, 35T, 50T	2 x Samtec LSHM	16	138 + 5 (QSPI or user I/Os)	4 x GTP	Differential MEMS oscillator for MGT clocking, XADC analog Input, eFUSE bit-stream encryption (AES), single supply

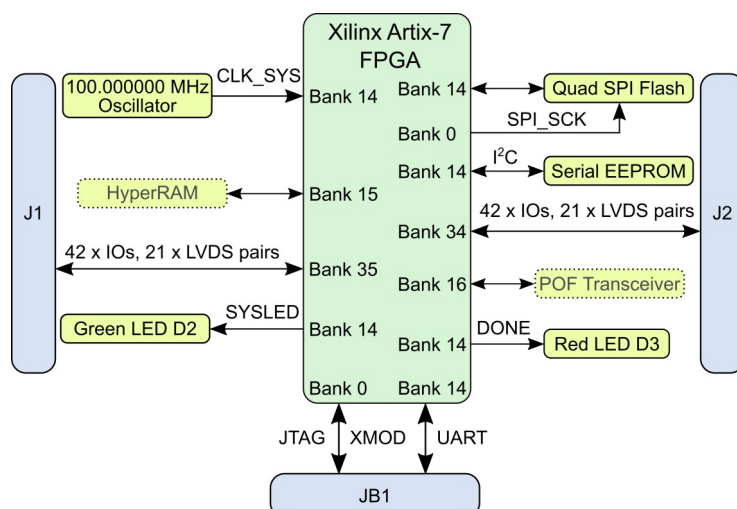
TE0725 Series

Xilinx Artix-7, Flash, HyperRAM, 2 x 50-pin Headers, 2.54 mm Pitch

ARTIX⁷



3.5 x 7.3 cm
form factor



<http://trenz.org/te0725-info>

Device list	Connectors	RAM max [MByte]	Flash [MByte]	EEPROM	Total I/O	Other Features
15T, 35T, 50T, 75T, 100T	2 x 50-pin headers	8 HyperRAM	32	16 KByte	87	Optional POF fiber optical adapter (125/250 Mbit/s), single supply

Lattice ICE40HX, Raspberry Pi HAT compatible, SRAM, Flash, Open-Source



**5.6 x 3.05 cm
form factor**

The diagram illustrates the pin configuration for the Lattice ICE40 HX4K FPGA SoC. The central component is the Lattice ICE40 HX4K FPGA SoC, which is divided into several banks. The connections are as follows:

- Bank 0 / 1:** Connected to 3x Red LEDs D2...D4 (LED1...3).
- Bank 2:** Connected to Push Button S1 (Boot Select Bit).
- Bank 1 / 2 / 3:** Connected to SRAM (16bit Interface).
- Bank 2:** Connected to 100.000000 MHz Oscillator.
- Bank 0:** Connected to Oscillator (optional).
- Bank 0:** Connected to Oscillator (optional).
- Bank 0:** Connected to 2x3 Pin Header J1 (5 I/O's).
- Bank 0:** Connected to 1x6 Pin Header J3 (FTDI USB to UART, 4 I/O's).
- Bank 0:** Connected to 2-Pin Header J2 (O5V).
- Bank 0:** Connected to PMOD P1 (8 I/O's).
- Bank 2:** Connected to PMOD P2 (8 I/O's).
- Bank 2 / 3:** Connected to PMOD P3 (8 I/O's).
- Bank 0 / 3:** Connected to PMOD P4 (8 I/O's).
- Bank 1:** Connected to UART (5 I/O's).
- Bank 0:** Connected to SPI.
- Bank 1:** Connected to SPI.
- Bank 2:** Connected to SPI.
- Bank 0:** Connected to FPGA Config. Flash Memory (I²C).
- Bank 0:** Connected to EEPROM (I²C).
- Bank 2:** Connected to RESET.
- Bank 2:** Connected to DONE.
- Bank 0:** Connected to 2x20 Pin Header P11.

Device list	Connectors	SDRAM max [MBit]	Flash [MByte]	Other Features
Lattice ICE40	4 2x6-pin Pmod connectors (no default)	4 external SRAM	8	100 MHz user clock, 3 user LED, supported by fully open source FPGA toolchain, fast FPGA configuration from Raspberry Pi, full FPGA design flow on Raspberry Pi (all open source)

Xilinx Spartan-7, Fully Open-Source Module with HyperRAM

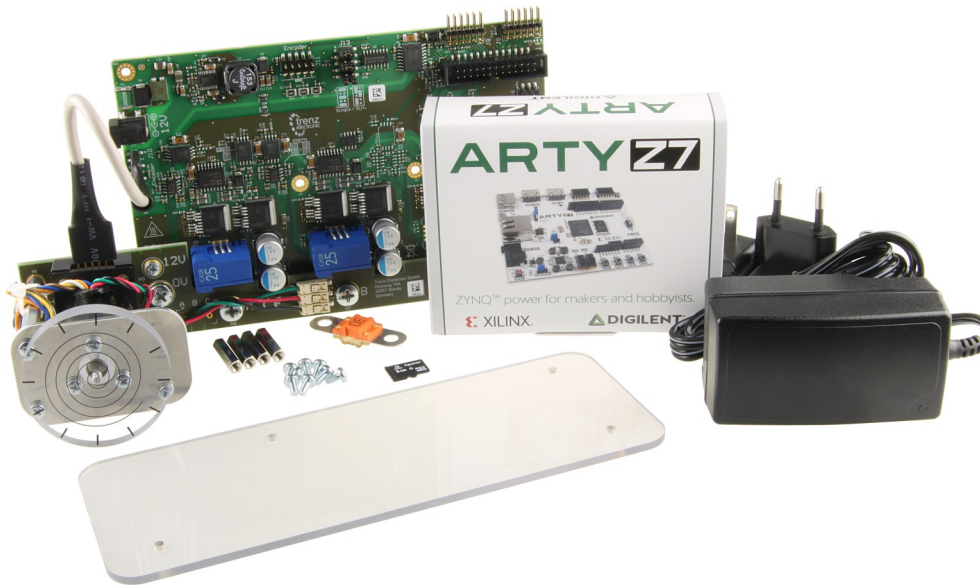
SPARTAN⁷ 

**2.7 x 5.2 cm
form factor**

The diagram illustrates the system architecture for the Xilinx Spartan XC7S25 FPGA. The central component is the **Xilinx Spartan XC7S25 FPGA**, which is divided into **Bank 14** and **Bank 34**. The connections are as follows:

- Top Connections:**
 - 1x20 Pin Header** (dashed box) is connected to **Bank 14** via **16 x IO**.
 - 1x40 Pin Header** (solid box) is connected to **Bank 14** via **32 x IO**.
- Internal Connections:**
 - SPI FLASH U6** (solid box) is connected to **Bank 14**.
 - 2 x LED red D1, D2** (solid box) is connected to **Bank 14**.
 - HyperRAM U2** (solid box) is connected to **Bank 14**.
 - FTDI/UART/4 x IO** (dashed box) is connected to **Bank 34**.
 - 1x6 Pin Header** (dashed box) is connected to **Bank 34** via **2 x IO**.
 - 2x3 Jumper Pin Header** (dashed box) is connected to **Bank 34** via **2 x IO**.
 - Oscillator 100 MHz, U3** (solid box) is connected to **Bank 34** via **2 x IO**.
 - LED red D3 (Power)** (solid box) is connected to **Bank 34** via **32 x IO**.
- Bottom Connections:**
 - 1x40 Pin Header** (solid box) is connected to **Bank 34** via **32 x IO**.
 - 1x20 Pin Header** (dashed box) is connected to **Bank 34** via **16 x IO**.
- Other Connections:**
 - 1x6 Pin Header** (dashed box) is connected to the top of the FPGA via **JTAG**.

Device list	Footprint compatible	Config PROM[[MBit]	HyperRAM DRAM [MBit]	Total I/O	Interface(s)	Supply	Other Features
7S25	7S6, 7S15, 7S50 FTGB-196 devices	64 MBit	64	Dual-Pinout DIP-40 or 50mil 80 pin for 32 or 64 FPGA 3.3V I/Os	Standard 1x6 FTDI cable serial	5V input	23K Logic Cells, 29K Flops, 45 36Kb BRAMs, 80 multi., fully open source



EDDP Motor Control Kit

The EDDP Kit enables rapid, simplified development and evaluation of three-phase motor control applications by providing software, documentation, binary images, editable source code to run on a Xilinx Zynq®-7000 All Programmable SoC along with associated hardware. For the first time ever, the highly parallel and deterministic benefits of FPGA-based motor control, offering up to 30-40x more responsiveness than traditional embedded approaches, is available in a C/C++ development environment. Furthermore, scalability with minimal CPU burden is increasingly differentiating for developers of such systems given the industry rise in demand for multi-axis motion control.

The three main hardware components included in the EDDP Kit are the development board, TEC0053, from Trenz Electronic as the motor driver board, the Arty Z7-10 from Digilent Inc. as the reference controller board, and a three-phase permanent magnet synchronous motor from Anaheim Automation as the reference motor. The main software components are the field oriented motor control algorithm implemented with the Xilinx Vivado® Design Suite and the Web UI. To edit the included design or replace with proprietary C/C++ code, users must have access to either a fully licensed seat of Vivado HLx Edition or the no-charge WebPACK Edition. Also required is the SDSoc™ tool, part of the SDx™ Development Environment, available for purchase or no cost evaluation from Xilinx. All other resources are available for free download from <http://trenz.org/EDDP/>.

Key Features

- Development and evaluation of three-phase motor control applications
- Speed and flexibility provided by FPGA-fabric in Xilinx Zynq®-7000 All Programmable SoC
- Implementation of a Field Oriented Control Algorithm with Vivado® SDSoc™, offloading from processor to embedded
- Available motor control modes consist of speed control and stator current control
- Internet connectivity provided by the Linux operating system running on an ARM processor
- Web UI and Network API for the control of the motor over internet
- Runs on 12V DC power
- Optionally, the power stage can be run from a separate 5V ... 48V DC power supply

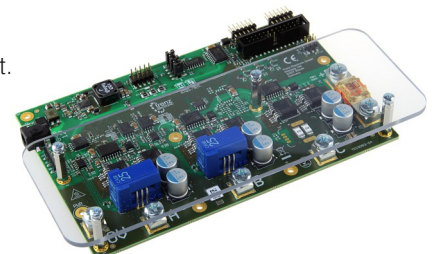
Other assembly options for cost or performance optimization plus high volume prices available on request.

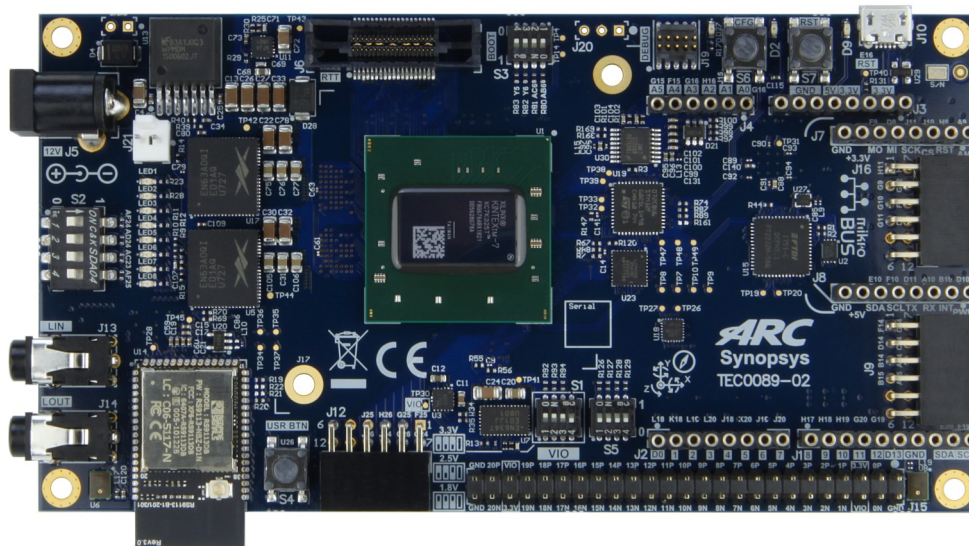
Resources

trenz.org/EDDP/ - including a Quick Start Guide, an User Manual for the EDDP Kit and the EDPS motor driver board, block diagram, design database and technical specifications

Support

A support forum especially for this product is accessible at <http://trenz.org/EDDPsupport>.





The DesignWare® ARC® EM Software Development Platform is a flexible platform for rapid software development on ARC EM processors and subsystems. It is intended to accelerate software development and debug of ARC EM processor-based systems for a wide range of ultra-low power embedded applications such as IoT, sensor fusion, and voice applications. It includes an FPGA-based hardware board with commonly used peripherals and interfaces for extensibility. Downloadable platform packages containing different hardware configurations enable the board to be programmed with different ARC EM processors and subsystems. The packages also contain the necessary software configuration information for the toolchain and embARC Open Software Platform.

The development platform is supported by Synopsys' MetaWare Development Tool Kit, which includes a compiler, debugger and libraries optimized for maximum performance with minimal code size. The embARC Open Software Platform (OSP), available online from embarc.org, gives developers online access to device drivers, FreeRTOS, middleware and examples that enables them to quickly start software development for their ARC-based embedded systems.

Each hardware configuration includes an ARC EM processor and subsystem with access to 16MB of PSRAM, 16MB of SPI Flash and a wide range of peripherals such as Audio Line In/Out, UART, SPI, I2C, and ADC. An on-board module providing Wi-Fi/Bluetooth functionality and a 9-D motion sensor enable fast development of IoT applications. Two digital MEMs microphones can also be used for the development of voice applications. The hardware is extensible using the popular Arduino® interface and extension is also possible with Digilent® Pmod™ Interfaces, mikroBUS™ headers and a 50-pin header. Debug and trace are handled with USB/JTAG interfaces and a NEXUS interface for ARC Real-Time Trace (RTT). The board includes a micro-SD card slot for loading application software.

Key Features

- Xilinx Kintex-7 XC7K325T-2FBG676C
- 32 MByte Quad-SPI Flash memory (for configuration and operation)
- USB-JTAG bridge FT232H
- FPGA configuration through Jtag and SPI Flash memory
- SPI Flash configuration through JTAG and USB
- Connectors
 - Arduino compatible pin headers
 - MicroBUS compatible pin headers
 - 3 x Pmod compatible pin headers
 - 50 pin header 2.54mm (40 single-ended IO, 20 differential lanes, variable VCCIO)
 - Mictor Debug connector
 - 10 pin Debug connector 2mm
- 2 x 8 MByte PSRAM
- 32 MByte User Quad-SPI Flash memory
- Micro SDcard Socket
- Wireless module RS9113-NBZ-D1C (Wi-Fi/BT/BLE)
- 3-axis gyroscope, 3-axis accelerometer, 3-axis magnetometer ICM-20948
- Stereo Audio Codec MAX9880A
- 2 x PDM Microphones SPK0641HT4H-1
- 2 x 3.5mm RCA audio jacks (input/output)
- 100MHz User Clock Oscillator SiT8008
- Status LEDs, Power LED
- 12V Power Supply (separately included in the scope of delivery)

TEC0330 PCIe FMC Carrier

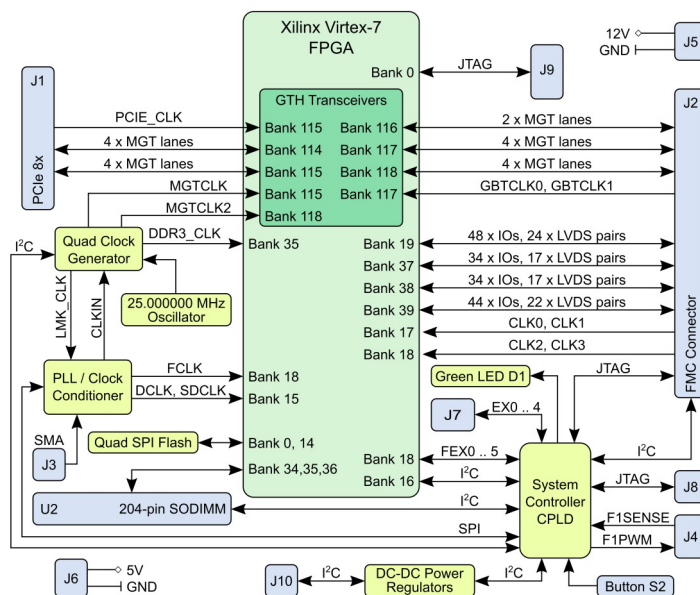
Xilinx Virtex-7, FMC HPC, 8 lane PCIe GEN2 card, DDR3 SO-DIMM Socket



VIRTEX⁷



<http://trenz.org/tec0330-info>



Device list	Flash [MByte]	SDRAM	Total I/O	Gbit Transceivers	Gbit Transceivers Transmission Rate	Other Features
XC7VX330T	32	DDR3 SO-DIMM Socket	up to 202 FPGA I/O pins on FMC connector	10 on FMC 8 on PCIe lanes	13.1 Gbit/s	FMC High Pin Count (HPC) connector, programmable clock generator

TEF1001 PCIe FMC Carrier

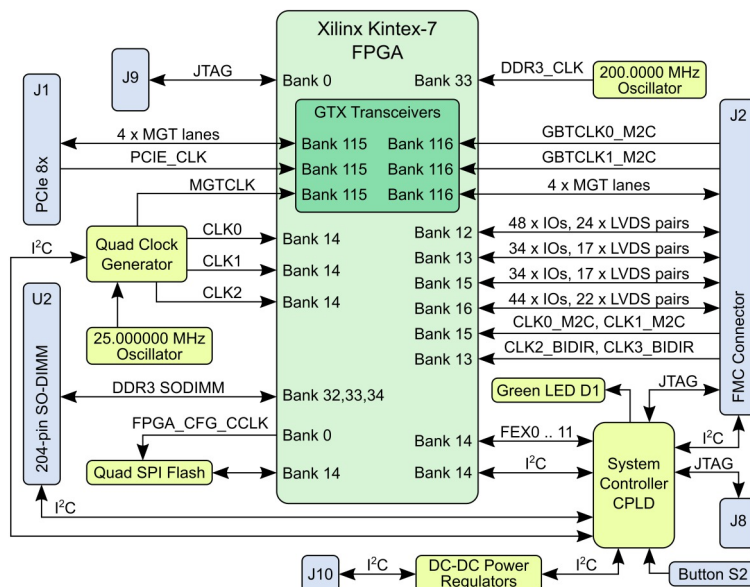
Xilinx Kintex-7, FMC HPC, 4 lane PCIe GEN2 card, DDR3 SO-DIMM Socket



KINTEX⁷



<http://trenz.org/tef1001-info>



Device list	Flash [MByte]	SDRAM	Total I/O	Gbit Transceivers	Other Features
XC7K160T	32	DDR3 SO-DIMM Socket	160 on FMC connector	4 on FMC 4 on PCIe lanes	Vita 57.1 FMC HPC slot, programmable clock generator, 200 MHz low jitter LVDS oscillator

TEF0007 Series

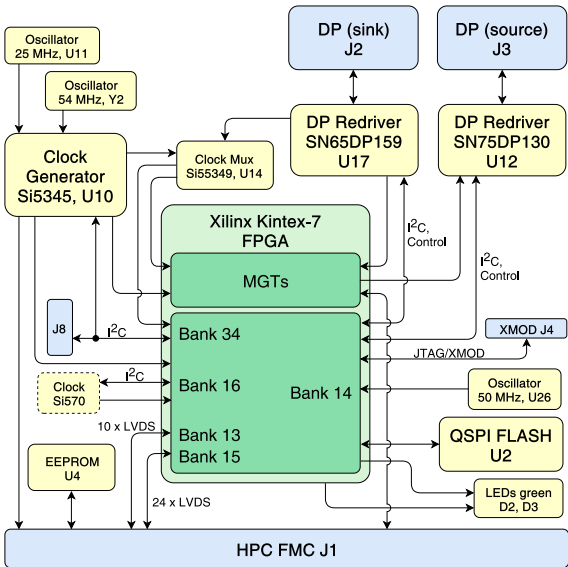
FMC Card with DisplayPort input and output



KINTEX⁷



<http://trenz.org/tef0007-info>



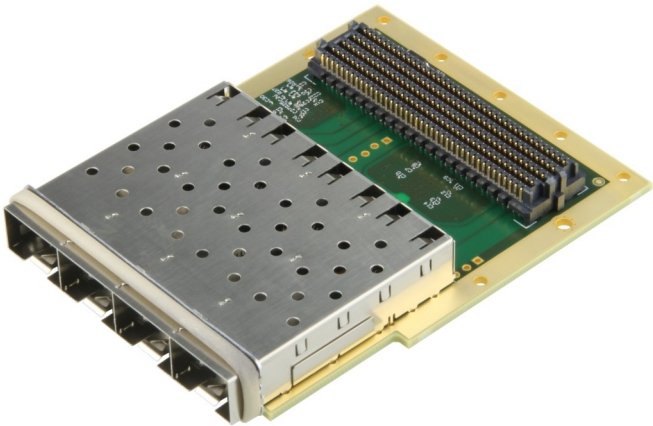
Device list	Connector	Flash [MByte]	Total I/O	Gbit Transceiver(s)	Other Features
Xilinx Kintex-7 160T	HPC FMC	32	34 differential (68 single ended)	4 x GTP	Data rates up to 5.4 Gbps, sink + source DP connector, 50 MHz oscillator, configurable PLL

TEF0008 Series

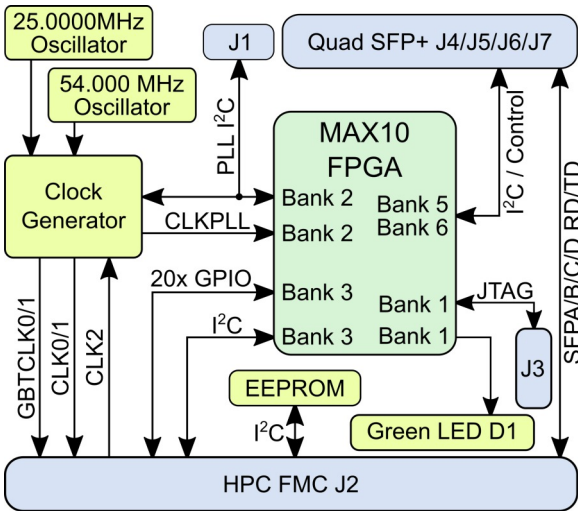
FMC Card with four SFP+ 10 GBit Ports based on VITA 57.1 FMC HPC Standard



intel



<http://trenz.org/tef0008-info>



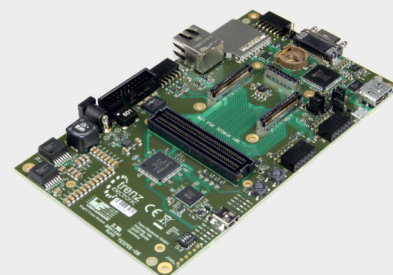
It is inteded for use on a FMC HPC carrier
and can not be used stand-alone.

Device list	Connector	Dimension	SFP+	Other Features
Intel MAX 10 10M08SAU169C8G	HPC FMC	69 x 84 mm, SFP+ connector excluded (+ 5.5 mm)	4 SFP+ 10 GBit ports for fiber optical SFP modules	Low-jitter programmable clock generator, 3.3V to 1.8V DCDC converter, 128 KBit EEPROM, status LED (green)

The carrier boards are baseboards for 4 x 5 SoMs, which exposes the modules B2B-connector-pins to accessible connectors and provides a whole range of on-board components to test and evaluate Trenz Electronic 4 x 5 SoMs.

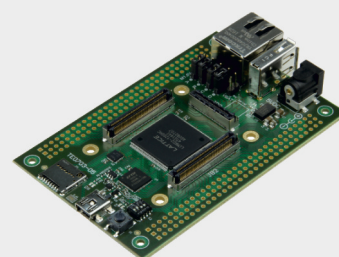
TE0701

- Overvoltage-, undervoltage- and reversed- supply-voltage-protection
- Barrel jack for 12V power supply
- Carrier Board System-Controller CPLD
- Mini CameraLink connector
- RJ45 Gigabit Ethernet MagJack
- FPGA Mezzanine Card (FMC-LPC) connector
- USB JTAG- and UART interface with Mini-USB connector
- HDMI transmitter with HDMI connector
- 8 x user LEDs, 2 x user push buttons, 2 x DIP switch
- Pmod connectors, Micro SD card socket and Micro-USB interface



TE0703

- 2 x VG96 connectors (mounting holes and solder pads)
- SDIO port expander with voltage-level translation
- Micro SD card socket
- 4 x user LEDs, 1 x user-push button, 2 x user configurable DIP switches
- Mini USB connector (USB JTAG and UART interface)
- RJ45 Gigabit Ethernet socket with 4 integrated LED's.
- USB host connector
- Barrel jack for 5V power supply input
- DCDC step-down converter for 3.3V power supply
- USB JTAG and UART interface

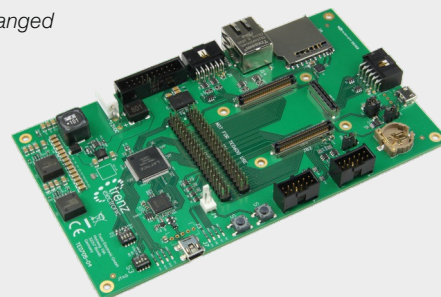


TE0705

TE0705 is a "downgraded" version of TE0701. As little as possible has been changed in functionality except the functionality that was removed.

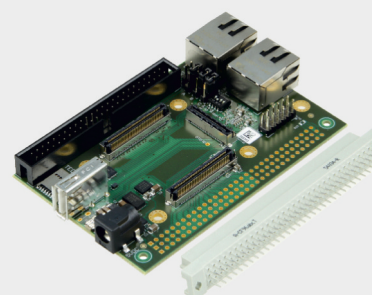
Changes from TE0701

- Pmod connectors changed to IDC headers
- HDMI removed
- CL connector removed
- USB connector position changed
- 5 pin header support added on both USB interfaces
- 12V DC power input connector changed to different type
- FMC connector removed and replaced by two dual row 100 mil pin headers



TE0706

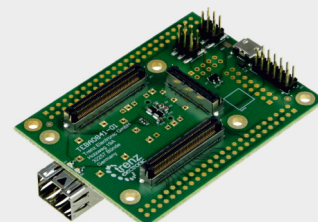
- VG96 connector and 50-pin IDC male connector socket
- SDIO port expander with voltage-level translation
- Micro SD card socket and a USB type A connector
- One user push button, user configurable DIP switch
- Two RJ45 Gigabit Ethernet MagJack
- One Ethernet PHY
- Barrel jack for 5 V power supply input
- DCDC step- down converter for 3.3V power supply
- JTAG pins on 12-pin header
- Three VCCIO selection jumper



TEBA0841

Mainly for the use with TE0841 and TE0741 modules.

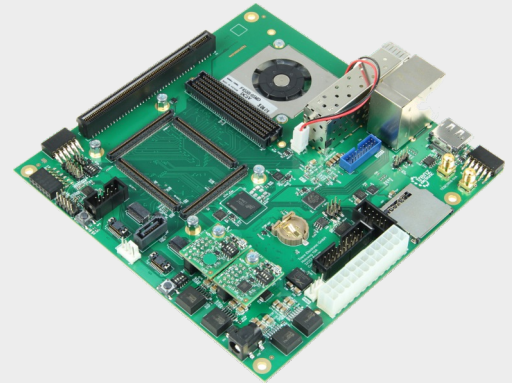
- XMOD (TE0790) pin header
- SFP connector
- Micro USB
- One pin header 16 pol. (JTAG, MGT-CLK, boot mode, RST, IOs)
- One pin header 10 pol. (SD IOs)
- Two pin headers 50 pol. (FPGA bank IOs and power)
- One pin header for FPGA bank power VCCIOA and 1 x for VCCIOD
- LDO voltage regulator 3.3V to 2.5V
- Two user LEDs (Red/Green)



Following carrier boards are baseboards for specific Trenz Electronic SoMs, which exposes the module's B2B-connector-pins to accessible connectors and provides a whole range of on-board components to test and evaluate Trenz Electronic SoMs.

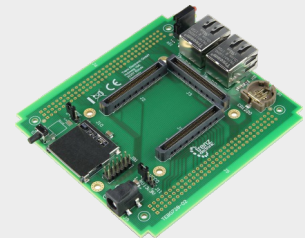
TEBF0808

- Mini-ITX form factor
- ATX power supply connector (12V only supply required)
- optional 12V standard power plug
- USB3.0 with USB3.0 HUB
- FMC HPC slot (1.8V max VCCIO)
- MicroSD card (bootable) and e.MMC (bootable)
- PCIe slot - one PCIe lane (16 Lane connector)
- Fan connectors, PC enclosure, FMC fan
- Intel front panel- and HDA audio-connector
- CAN FD transceiver (10 pin IDC connector)
- Displayport Single Lane
- One SATA Connector
- Dual SFP+
- Gigabit Ethernet RJ45
- One Samtec FireFly (4 GT lanes bidir.)
- One Samtec FireFly connector for reverse loopback
- 20 pins ARM JTAG connector (PS JTAG0)



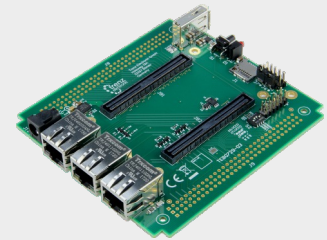
TEB0728

- Trenz TE0728 module socket (3 x Samtec SEM connectors 80 pins)
- Two RJ45 Ethernet socket
- Micro SD card socket
- Barrel Jack for 5V power supply
- 3 x user LEDs (red/yellow/green)
- One user push button



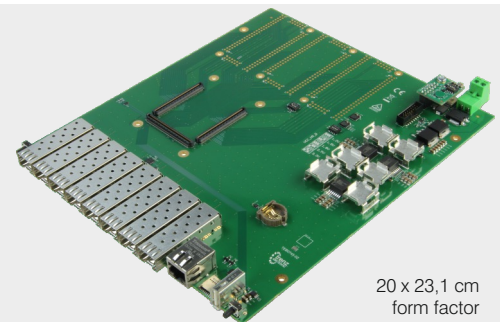
TEB0729

- Trenz TE0729 module socket (2 x Samtec BTE/BSE connectors 120 pins)
- 5V board supply via DC jack
- Three RJ45 Ethernet sockets
- One MicroUSB and one SD card connector
- One 128K I2C CMOS Serial EEPROM
- One 2K I2C Serial EEPROM
- XMOD (TE0790) pin header
- Two pin header FPGA bank power supply
- One VBat pin header and two VG96 pin header
- One user push button, one LED (red), user switch FPGA boot mode



TEB0745

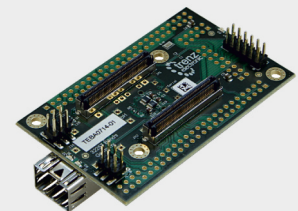
- Trenz TE0745 module socket (3 x Samtec ST5 connectors 160 pins)
- 24V power supply over ARKZ950/2 connecting terminal
- XMOD (TE0790) Pin Header (JTAG / UART)
- One EMI Network Filter
- MicroSD connector
- RJ45 Ethernet connector
- USB Host connector
- Eight SFP connector
- Six pin header 50 pol. (FPGA bank I/O and power)
- Six pin header 12 pol. (FPGA bank I/O and power)



20 x 23,1 cm
form factor

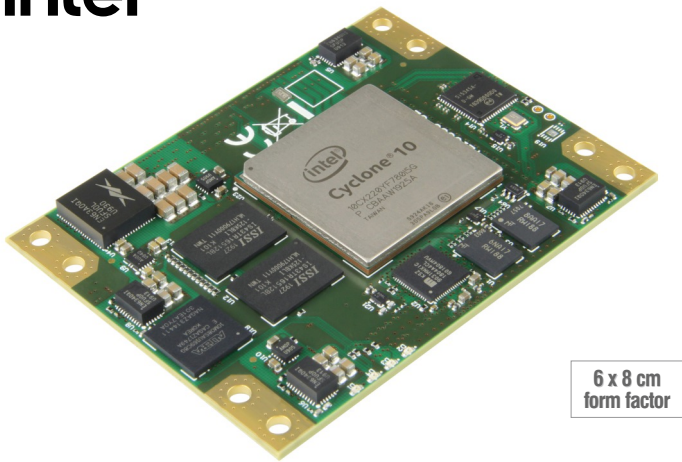
TEBA0714

- Trenz TE0714 module socket (2 x Samtec LSHM connectors 100 pins)
- XMOD (TE0790) pin header
- Two pin headers 50 pol. (FPGA bank I/O and power)
- SFP connector
- LDO voltage regulator 3.3V to 2.5V
- Two user LEDs (red/green) and one LED (red)
- One pin header 16 pol. (JTAG, MGT-CLK, boot mode, XADC, I/O's)
- One pin header 10 pol. (I/O)
- One pin header for FPGA bank power VCCIO34
- One pin header for FPGA bank power V_CFG (1.8 VOUT, 2.5V, 3.3 VOUT)



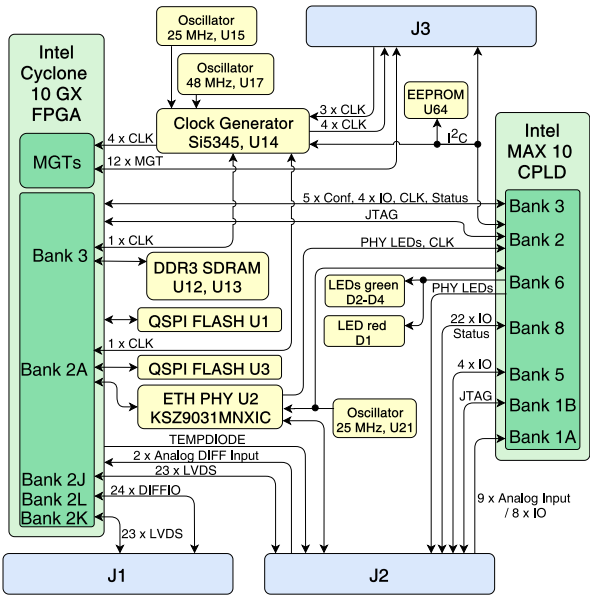
TEI0006 Series

Intel Cyclone 10 GX SoM, DDR3, Flash, Ethernet, Baseboard available



6 x 8 cm
form factor

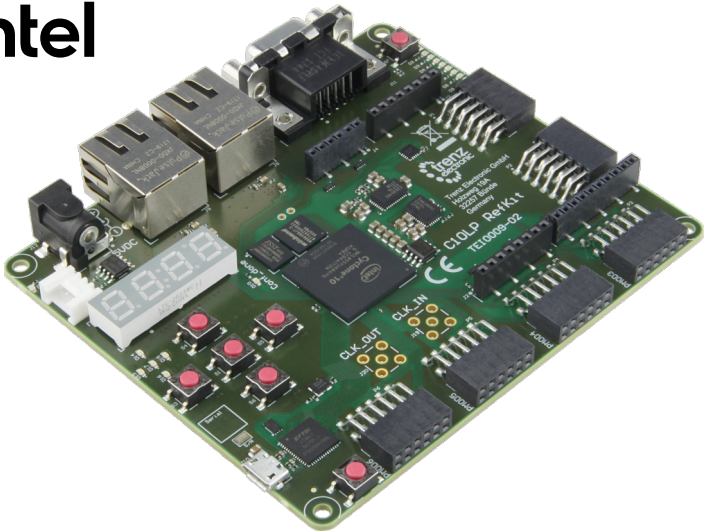
<http://trenz.org/tei0006-info>



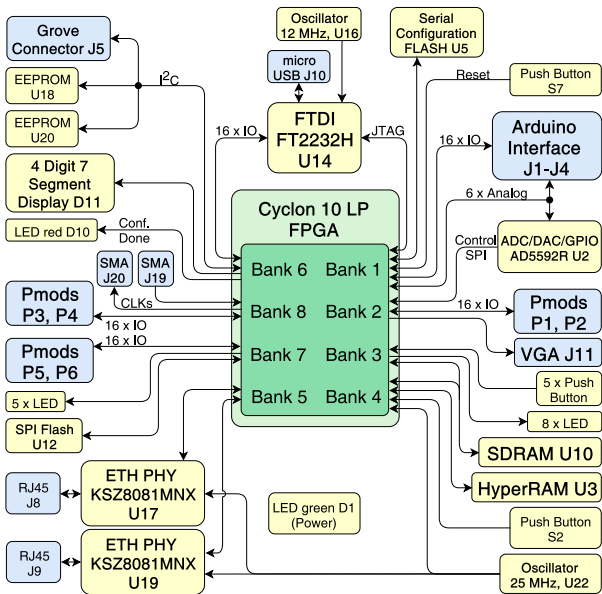
Device list	Connectors	SDRAM [GByte]	Flash [MByte]	Ethernet	Other Features
Cyclone 10 GX 10CX220YF780I5G	3 x Samtec ST5	2 DDR3	256	1 Gbit	Intel MAX 10 as power sequencer, EEPROM, 4 LEDs, 5V input voltage

TEI0009 C10LP RefKit Development Board

Intel Cyclone 10 LP, Integrated USB Programmer2, 2 x 10/100 Ethernet, USB2.0

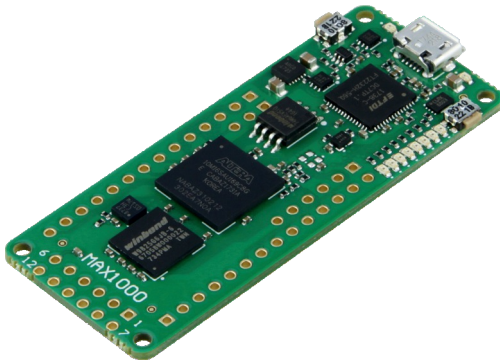


<http://trenz.org/tei0009-info>



Device list	Connectors	SDRAM max [MBit]	User Flash QSPI [MBit]	HyperRAM max [MBit]	Flash max [MBit]	Ethernet PHY	USB	Other Features
Cyclone 10 LP 10CL055YU484C8G 55 kLE in 484-pin	QSE (for LVDS), Pmod, Arduino, SMA	512	Up to 512	128	32	2 x 10/100	USB2.0	Integrated USB programmer2

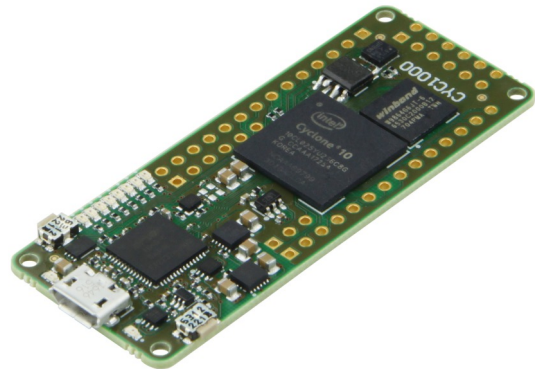
intel



Resources <http://trenz.org/max1000-info>

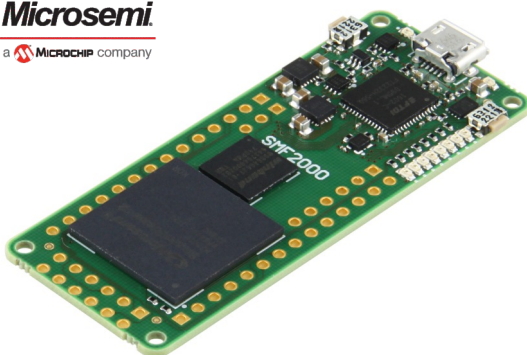
MAX1000 IoT/Maker board, TEI0001 series, Intel MAX 10 10M08SAU169C8G or 10M16SAU169C8G FPGA, 8/16 kLE, 8 to 32 MByte SDRAM (max. 64 MByte), 8 MByte Flash, USB-Programmer on-board, JTAG and UART over Micro USB2.0 connector, ADC 8 x 12 Bit, 12 MHz oscillator, optional MEMS oscillator, optional Pmod headers, supply USB/pins, 2 switches, 8 configurable and 2 status LEDs, power can be supplied as 5V from the USB port or via a separate pin

intel



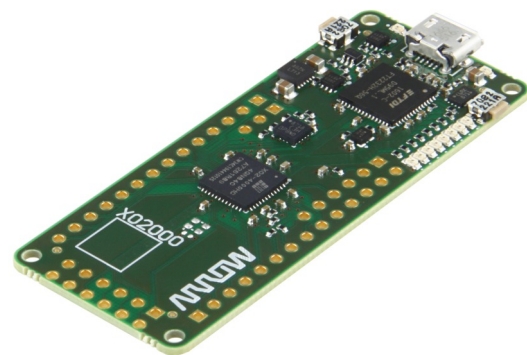
Resources <http://trenz.org/cyc1000-info>

CYC1000, TEI0003 series, Intel Cyclone 10CL025YU256 C8G FPGA, 25 kLE, optional 10CL006, 10CL010, 10CL016, 8 MByte SDRAM, 2 MByte Flash, 21 I/O Arduino MKR compatible headers, JTAG and UART over Micro USB2 connector, LIS3DH 3-axis accelero-meter, 2 x 14-pin headers providing 23 GPIOs, 1 x 3-pin header providing 2 GPIOs, Pmod: 2 x 6-pin support, 8 configurable and 2 status LEDs, user push button, 5V single power supply with on-board voltage regulators



Resources <http://trenz.org/smf2000-info>

SMF2000, TEM0001 series, Microsemi SmartFusion2 M2S010-VFG400 FPGA, 8 MByte SDRAM, 8 MByte Flash, 25 MHz system clock and 32.768 KHz auxiliary clock, JTAG and UART over Micro USB2.0 connector, 1 x 3-pin header for Live Probes, 1 x Pmod header providing 8 I/O, 2 x 14-pin header (2.54 mm pitch) providing 23 I/O, 9 user LEDs, 1 user push button

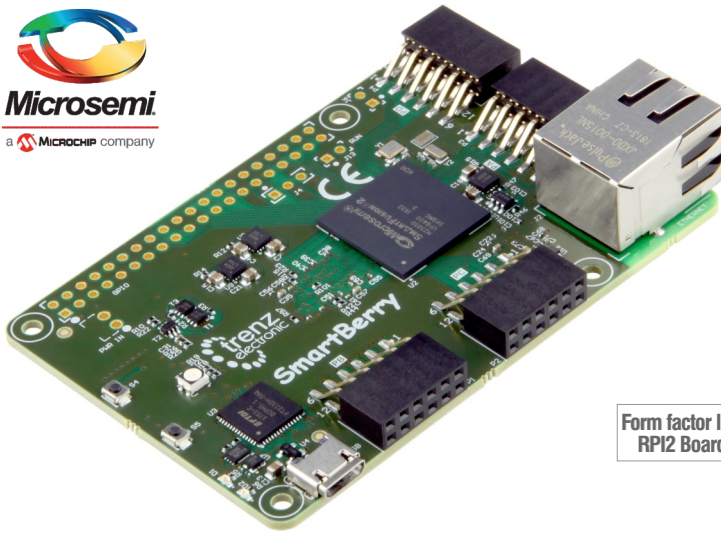


Resources <http://trenz.org/xo2000-info>

LX02000, TEL0001 series, Lattice X02-4000 FPGA, 22 I/O on MKR header, 2 I/O on additional header, optional Pmod header (+8 I/O), on-board USB/JTAG, on-board USB/serial, 100 MHz MEMS clock oscillator, 2 push buttons, 8 LEDs, supply: USB or 5V from pin header, RC-networks

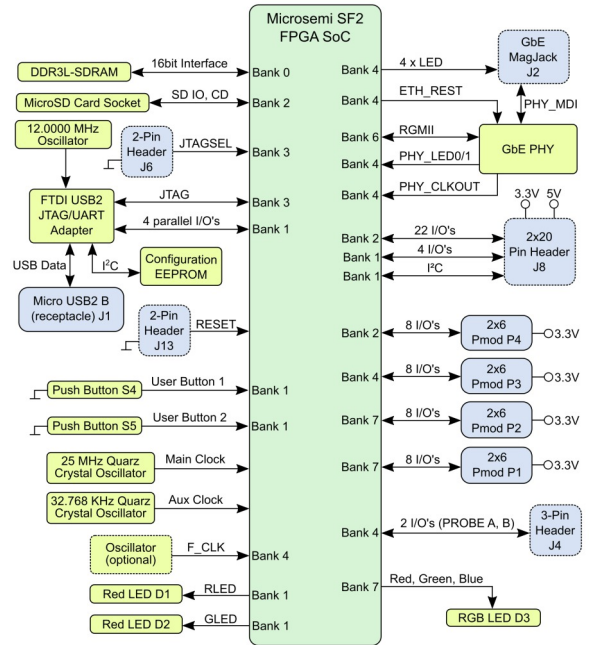
TEM0002 SmartBerry Series

Microsemi M2S010, DDR3, Ethernet PHY with RJ45 MagJack



Form factor like
RPI2 Board

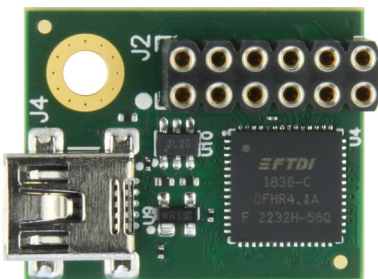
<http://trenz.org/smartberry-info>



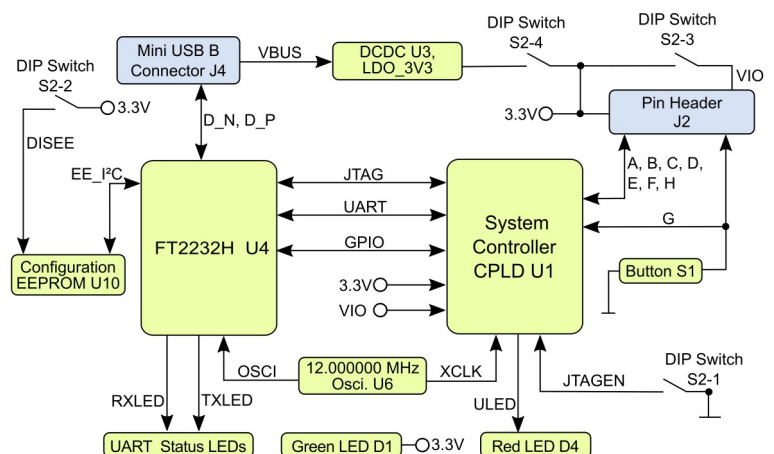
Device list	SDRAM [GBit]	Ethernet	Total I/O	Connectors	on-board	Other Features
Microsemi M2S010-VFG400	1 DDR3	1 GBit Ethernet PHY with RJ45 MagJack	Raspberry Pi compatible header with 26 I/O + I2C	MicroSD card socket, 4 Pmod headers	USB/JTAG USB/serial	2 push buttons

TE0790 XMOD FTDI JTAG Adapter

XMOD Form Factor, FT2232H, Lattice X02-256 CPLD



2 x 2.5 cm
form factor



Comes in two versions

a) compatible with Xilinx tools or

b) not compatible with Xilinx tools, for independent use

<http://trenz.org/te0790-info>

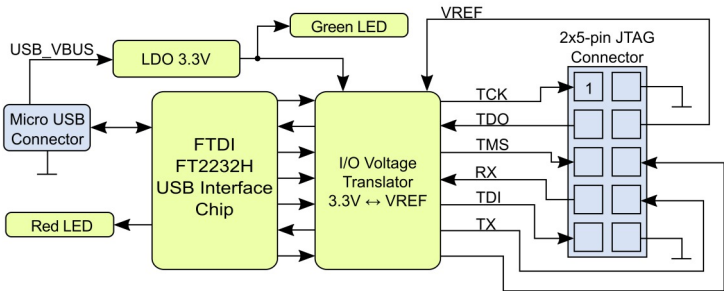
Device	Form Factor	FT2232H	Total I/O	Other Features
Lattice X02-256 CPLD	Xmod, M3 mounting hole	Mini USB connector, channel B RX/TX LED's, EEPROM	8 universal I/O pins	Step down DCDC converter for optional power supply via USB-power, 4 position DIP switch

TEI0004 ARROW USB Programmer2

For Development with Intel FPGAs, 2.54 mm Header



1.35 x 2.2 cm
form factor



<http://trenz.org/tei0004-info>

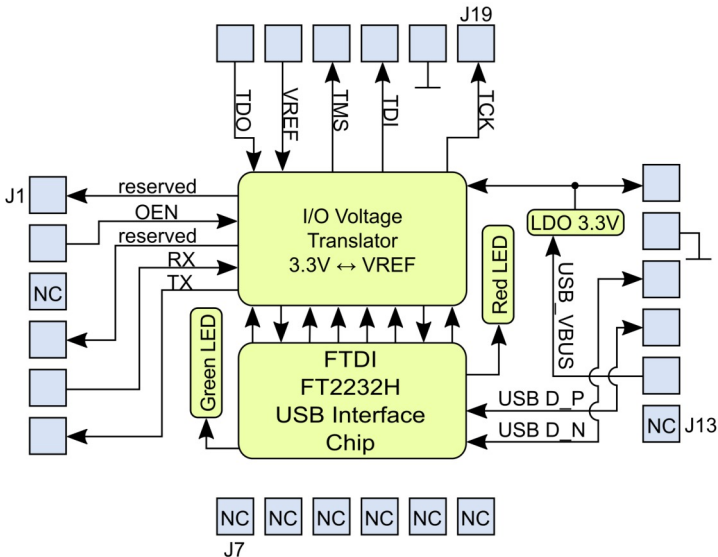
Supported by	JTAG Connector	USB	Voltage levels	Other Features
Intel Quartus programmer	Standard 2 x 5-pin header	MicroUSB connector USB2.0 HS support	1.8V - 3.3V	Additional support for UART, red activity LED, green power-on LED

TEI0005 FPGA Programmer2 Module

FT2232H based JTAG Programmer, Surface-Mount module



1.7 x 1.7 cm
form factor



<http://trenz.org/usbprogrammer2>

Device list	Supported	Powered	Compatible	Other Features
FTDI FT2232H USB2.0 interface	by Intel Quartus (JTAG mode only)	via USB	SMT pick and place assembly process	Additional UART Channel available, activity LEDs, UART interface available, two I/O pins reserved for future use

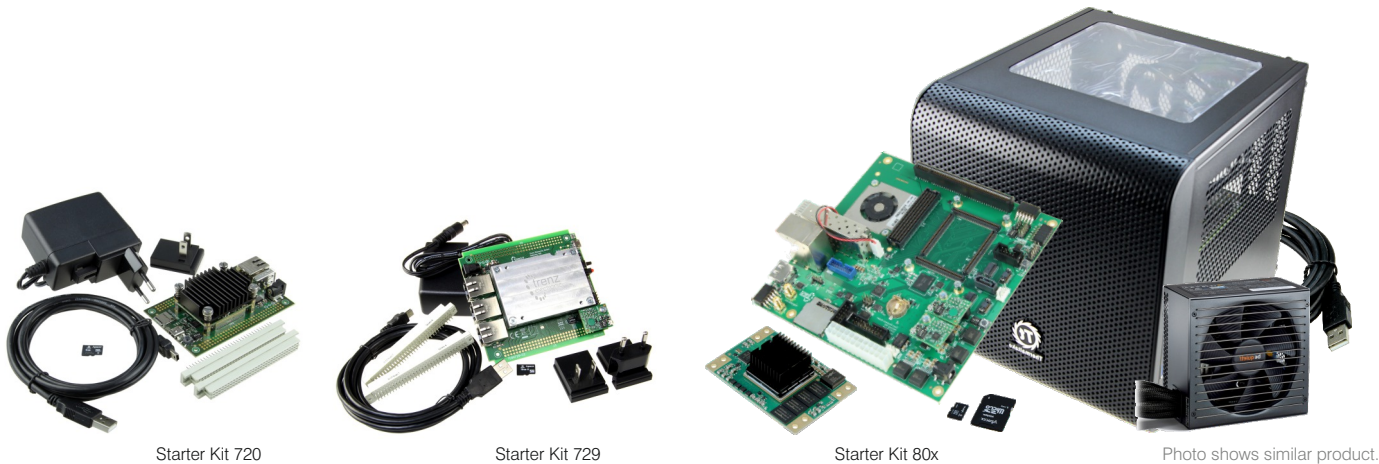
Trenz Electronic Starter Kits

Pre-assembled and ready-to-use

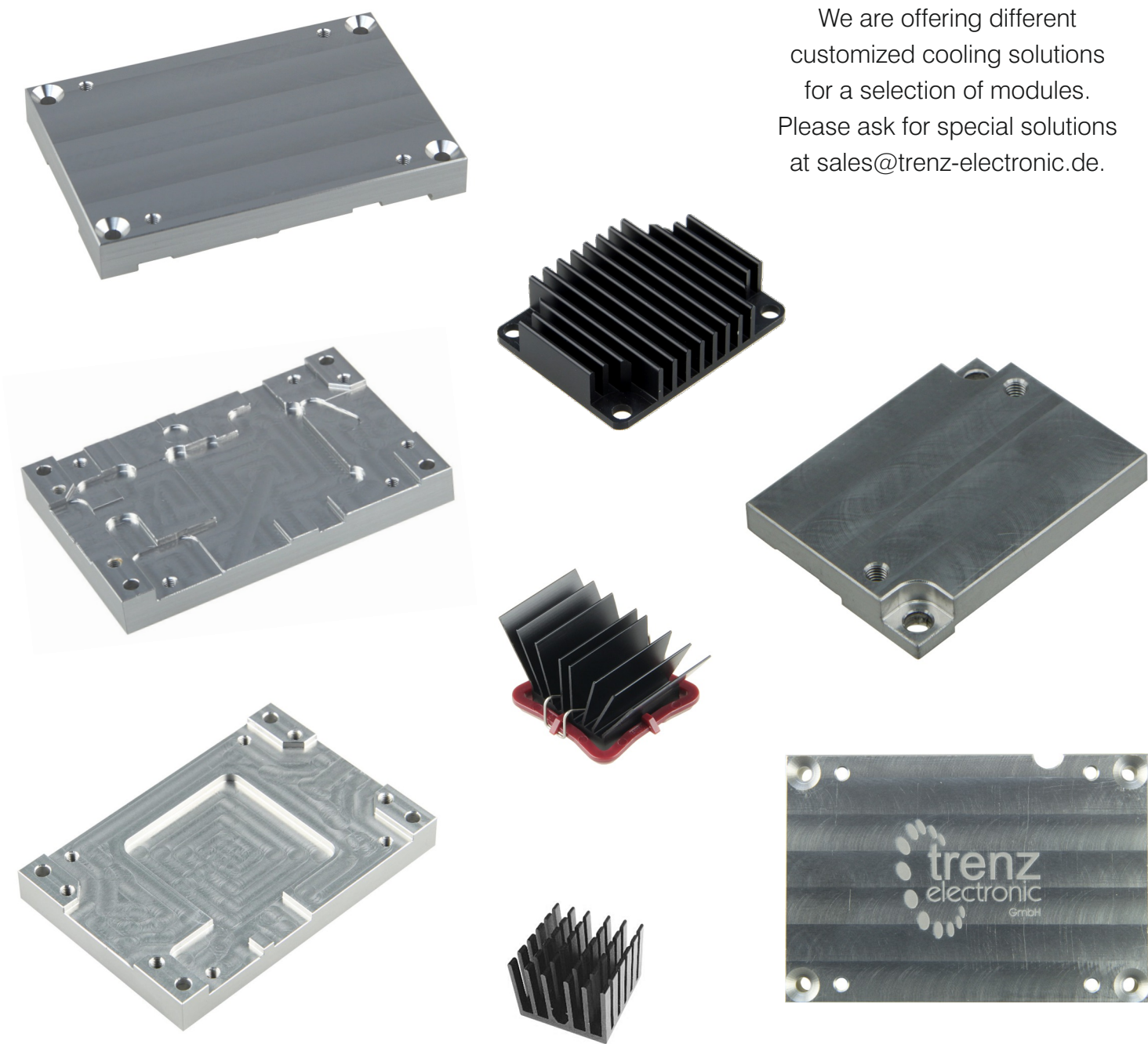


In general our Starter Kits contain a Trenz Electronic micromodule with a pre-assembled heat sink mounted on a Trenz Electronic baseboard. The TE08xx series modules are build in a black Core V1 Mini-ITX Enclosure. All this provided with a fitting power supply including different adapters, a micro SD card, a USB cable plus screws and bolts. Different module variants can be integrated on request.

	Starter Kit 720	Starter Kit 729	Starter Kit 803	Starter Kit 807	Starter Kit 808
Module	TE0720	TE0729	TE0803	TE0807	TE0808
FPGA	Xilinx Zynq-7020	Xilinx Zynq-7020	Xilinx Zynq UltraScale+	Xilinx Zynq UltraScale+	Xilinx Zynq UltraScale+
Baseboard	TE0703	TEB0729	TEBF0808	TEBF0808	TEBF0808
Enclosure	-	-	Core V1 Mini-ITX	Core V1 Mini-ITX	Core V1 Mini-ITX
Power Supply	Universal power supply unit	Universal power supply unit	Be Quiet! 400W ATX Power Supply	Be Quiet! 400W ATX Power Supply	Be Quiet! 400W ATX Power Supply
Heat Sink	Heat sink for TE0720, spring-loaded embedded	KK0729-02 TE custom built	BGA Heat sink	SuperGRIP/MaxiFLOW Heat sink	BGA Heat sink
USB Cable	✓	✓	✓	✓	✓
MicroSD Card	✓	✓	✓	✓	✓
Screws & Bolts	✓	✓	✓	✓	✓



We are offering different customized cooling solutions for a selection of modules. Please ask for special solutions at sales@trenz-electronic.de.



Available cooling solutions

Module	TE0600	TE0710	TE0712/ TE0713	TE0714	TE0715	TE0720	TE07290
Trenz Electronic Article Number	26920	26925	26924	KK0714-02	26923	26922	KK0729-02TE

Module	TE0741	TE0745	TE0803	TE0807	TE0808	TE0820/ TE0841	TEB0911/ TEF1001
Trenz Electronic Article Number	26921	KK0745-02	KK0803-03 and 29665	KK0807-02	KK0808-03 and 30137	28606	25130

Module series comparison table

For Trezz Electronic Modules

XILINX.										
	Device family	Device list	Form Factor/ size [cm]	Connectors	Programmable logic family	Processing system	SDRAM [MByte] max	Flash [MByte]	EEPROM	
TE0710	Artix-7	35T, 50T, 75T, 100T	4 x 5	2 x Samtec LSHM	Artix-7	MicroBlaze	512 DDR3	32	-	
TE0711	Artix-7	35T, 50T, 75T, 100T	4 x 5	2 x Samtec LSHM	Artix-7	MicroBlaze	-	32	-	
TE0712	Artix-7	35T, 50T, 75T, 100T, 200T	4 x 5	3 x Samtec LSHM	Artix-7	MicroBlaze	1024 DDR3	32	MAC address	
TE0713	Artix-7	15T - 200T	4 x 5	3 x Samtec LSHM	Artix-7	MicroBlaze	1024 DDR3L	32	-	
TE0714	Artix-7	15T, 35T, 50T	4 x 3	2 x Samtec LSHM	Artix-7	MicroBlaze	-	16	-	
TE0715	Zynq-7000	Z-7015, Z-7030	4 x 5	3 x Samtec LSHM	Z-7015: Artix-7 Z-7030: Kintex-7	2 x Cortex A9	1024 DDR3	32	MAC address	
TE0720	Zynq-7000	Z-7020	4 x 5	3 x Samtec LSHM	Artix-7	2 x Cortex A9	1024 DDR3	32	MAC address	
TE0724	Zynq-7000	Z-7010, Z7020	6 x 4	1 x Samtec ST5	Artix-7	2 x Cortex A9	1024 DDR3L	32	MAC address	
TE0728	Zynq-7000	Z-7020 (automotive)	6 x 6	3 x Samtec SEM	Artix-7	2 x Cortex A9	512 DDR3	16	8 KByte	
TE0729	Zynq-7000	Z-7020	5.2 x 7.6	2 x Samtec BTE	Artix-7	2 x Cortex A9	512 DDR3	32	3 x MAC address	
TE0741	Kinex-7	70T, 160T, 325T, 410T	4 x 5	3 x Samtec LSHM	Kintex-7	MicroBlaze	-	32	-	
TE0745	Zynq-7000	Z-7030, Z-7035, Z-7045	5.2 x 7.6	3 x Samtec ST5	Kintex-7	2 x Cortex A9	1024 DDR3L	64	MAC address	
TE0782	Zynq-7000	Z-7035, Z-7045, Z-1000	8.5 x 8.5	3 x Samtec QTH	Kintex-7	2 x Cortex A9	1024 DDR3	32	2 x MAC + 16 KB	
TE0783	Zynq-7000	Z-7035, Z-7045, Z-1000	8.5 x 8.5	3 x Samtec QTH	Kintex-7	2 x Cortex A9	1024 DDR3 connected to PL 2024 DDR3 connected to PS*	32	1 x MAC + 16 KB	
TE0803	Zynq UltraScale+	ZU2CG-ZU5CG, ZU2EG-ZU5EG, ZU4EV, ZU5EV	5.2 x 7.6	4 x Samtec ST5	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128	-	
TE0807	Zynq UltraScale+	ZU4CG-ZU7CG, ZU4EG-ZU7EG, ZU4EV-ZU7EV	5.2 + 7.6	4 x Samtec ST5	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128	16 KByte	
TE0808	Zynq UltraScale+	ZU6EG-ZU15EG	5.2 + 7.6	4 x Samtec ST5	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128	16 KByte	
TE0820	Zynq UltraScale+	ZU2CG-ZU5CG, ZU2EG-ZU5EG, ZU4EV, ZU5EV	4 x 5	3 x Samtec LSHM	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	4096 DDR4	128	-	
TE0821	Zynq UltraScale+	ZU2CG-ZU5CG, ZU2EG-ZU5EG	4 x 5	3 x Samtec LSHM	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	4096 DDR4	128	1 x MAC	
TE0823	Zynq UltraScale+	ZU2CG-ZU5CG, ZU2EG-ZU5EG	4 x 5	3 x Samtec LSHM	UltraScale+	Up to 4 x Cortex A53 + 2 x Cortex R5	2024 LPDDR4	128	1 x MAC	
TE0835	Zynq UltraScale+ RFSoc	ZU25DR	6.5 x 9	2 x Samtec ST5	UltraScale+	4 x Cortex A53 + 2 x Cortex R5	4096 DDR4	128	1 x MAC	
TE0841	Kintex UltraScale	KU35, KU40	4 x 5	3 x Samtec LSHM	UltraScale+	MicroBlaze	4096 DDR4	64	-	
TEB0912	Zynq UltraScale+	ZU11-ZU19	12 x 18	Firefly sockets	UltraScale+	4 x Cortex A53 + 2 x Cortex R5	4096 DDR4 connected to PS 4096 DDR4 connected to PL	2 x 64	4 x	
intel										
	Device family	Device list	Form Factor/ size [cm]	Connectors	Programmable logic family	Processing system (HW/SW)	SDRAM [MByte] max	Flash [MByte]	EEPROM	
CR00010	MAX 10	10M08	4.48 x 5.6	CRUV1 (1 x HS, 1 x LS) 2 x 34 pin header	MAX 10	-/+	8	8	Config. EEPROM	
TEI0001	MAX 10	10M08	2.5 x 6.15	-	MAX 10	-/+	8-64	8	Config. EEPROM	
TEI0003	Cyclone 10 LP	10CL025, 10CL006, 10CL010,10CL016	2.5 x 6.15	-	Cyclone 10 LP	-/+	8	2	-	
TEI0006	Cyclone 10 GX	10CX220, 10CX150, 10CX105	6 x 8	3 x Samtec ST5	Cyclone 10 GX	-/+	2024 DDR3	256	2 KBit	
TEI0009	Cyclone 10 LP	10CL055	9.5 x 11	-	Cyclone 10 LP	-/+	64	64	2 x MAC address	
TEI0010	MAX 10	10M08	2.5 x 6.15	-	MAX 10	-/+	8	8	Config. EEPROM	
TEI0180	Agilex F	AGFA014R24A3E3VR0	16 x 16, COM- HPC Server Size D	2 x 400 pin Samtec	Agilex F	optional/ +	4 x SODIMM DDR4	512	optional	

Other assembly options for cost or performance optimization available on request.

Cooling solutions and carrier boards are available.

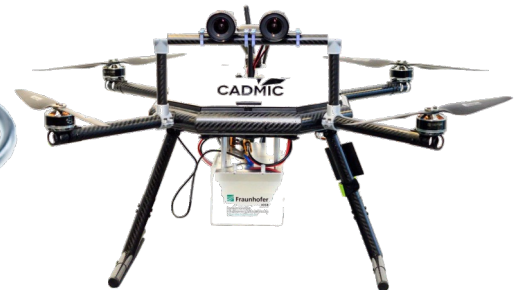
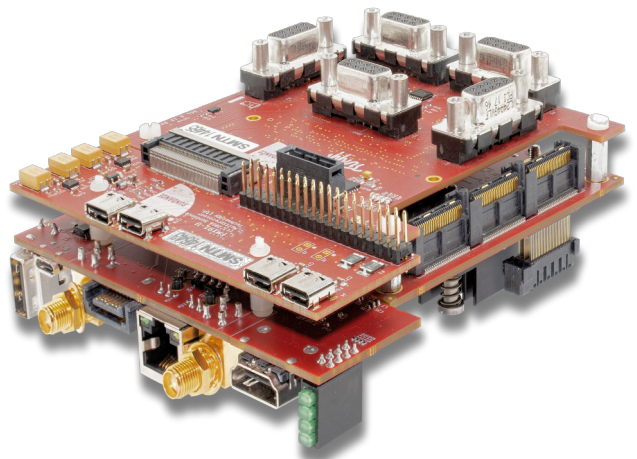
	e.MMC	Ethernet PHY	USB PHY	Total I/O	GBit transceiver	Other features
	-	2 x 100 MBit	-	112	-	Single supply
	-		USB2.0 UART/FIFO	178	-	Single supply
	-	100 MBit	-	158	4 x GTP	Programmable clock generator, single supply
	-	-	USB3.0	152	4 x GTP	Programmable clock generator, single supply
	-	-	-	144	4 x GTP	Differential MEMS osc. for MGT clocking, XADC analog input, GT reference clock input, single supply
	-	1 GBit	USB2.0 OTG	132 + 14 MIO	Z-7015: 4 x GTP Z-7030: 4 x GTX	Programmable clock generator, real time clock, single supply
	4 - 64 GByte	1 GBit	USB2.0 OTG	152 + 14 MIO	-	Real time clock, single supply, automotive grad available
	-	1 GBit	-	PL: 80 PS: 20	-	CAN, single supply
	-	2 x 100 MBit	-	124 + 34 MIO	-	Automotive, real time clock, CAN, single supply
	4 - 64 GByte	2 x 100 MBit, 1 GBit	USB2.0 OTG	136 + 14 MIO	-	Real time clock, single supply
	-	-	-	144	8 x GTX	Programmable clock generator, single supply
	-	1 GBit	USB2.0 OTG	250 + 6 MIO	8 x GTX	Real time clock, single supply
	4 - 64 GByte	2 x 1 GBit	2 x USB2.0 OTG	250 + 2 MIO	16 x GTX	Programmable clock generator, real time clock, single supply
	4 - 64 GByte	1 GBit	USB2.0 OTG	166 + 12 MIO + 40 CPLD muxed IO	16 x GTX	* 32-bit and 64-bit wide DDR3, programmable clock generator, real time clock, single supply
	-	-	-	156 + 65 MIO	4 x GTR (PS)	GPU/VCU depending on device, programmable clock generator, single supply
	-	-	-	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply
	-	-	-	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply
	4 - 64 GByte	1 GBit	USB2.0 OTG	132 + 14 MIO	4 x GTR (PS)	GPU/VCU depending on device, programmable clock generator, real time clock, single supply
	8 - 64 GByte	1 GBit	USB2.0 OTG	34 HP, 96 HD + 14 MIO	4 x GTR (PS)	GPU/VCU depending on device, programmable clock generator, single supply
	8 - 64 GByte	1 GBit	USB2.0 OTG	132 HP + 14 MIO	4 x GTR (PS)	GPU/VCU depending on device, programmable clock generator, single supply
	-	1 GBit	USB2.0 OTG	132 + 14 MIO	4 x GTR (PS)	Programmable clock generator, real time clock, single supply
	-	1 GBit	-	144	8 x GTH	Programmable clock generator, single supply
	-	2 x GBit	USB2.0	184	32 x GTH, 16 x GTY	4 x IDC for PL HD IO/LVDS, M2 PCIe SSD, M2 WAN/WLAN slot (PCIe/USB), on-board USB JTAG and UART, CAN, real time clock, single supply
	e.MMC	Ethernet PHY	USB PHY	Total I/O	GBit transceiver	Other features
	-	-	USB2.0	24 + 32	-	User Push Buttons and LED
	-	-	USB2.0	31	-	3-axis accelerometer, on-board USB Programmer, JTAG/UART over microUSB2.0 connector, Pmod header, 2 x 14 pin headers, 1 x 3 pin header, single supply
	-	-	USB2.0	21	-	3-axis accelerometer, Pmod: 2 x 6 pin support, 8 user LED, 1 user push button, single supply
	-	1 GBit	-	226	-	Intel MAX 10 as system controller (CPLD), programmable oscillator, single supply, baseboard available
	-	2 x 10/100 MBit/s	USB2.0	70	-	Up to 128 MByte HyerRAM, integrated USB Programmer2, Arduino and Pmod compatible pin headers, Grove connector, D-SUB connector for VGA, SMA connectors, 7-segment display
	-	-	USB2.0	29	-	MEMS 3-axis accelerometer, fully calibrated single-chip temperature sensor, smoke detector, USB/JTAG programmer, single supply
	8 GByte (optional)	1 GBit (optional)	USB2.0 (optional)	N/A	16 + 24	Intel MAX 10 as system controller, PLL clock generator

Sundance VCS System - Vision, Control and Sensors.

The Sundance VCS system is a PC/104 Linux stack that is ideally suited to controlling all forms of high precision robotics. It is comprised of two main components, namely the EMC2 board which is a PCIe/104 OneBank™ carrier for a Trenz compatible SoC Module and the FM191 expansion card that fans out the I/Os from the SoC to the outside world.

A Xilinx Zynq MPSoC is the heart of the VCS-1 and provides 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and FPGA acceleration, using a Trenz TE0820 SoM.

The versatility of the VCS system is derived from the modular concept of the SoM processing element on a PC/104 board, combined with a separate I/O Module. This gives it plenty of ADC, DAC, I/O and expansion possibilities with PC/104 options. The VCS also has all of the typical interfaces to allow the VCS to act like a PC with HDMI display, SATA, four USB C ports and Ethernet.

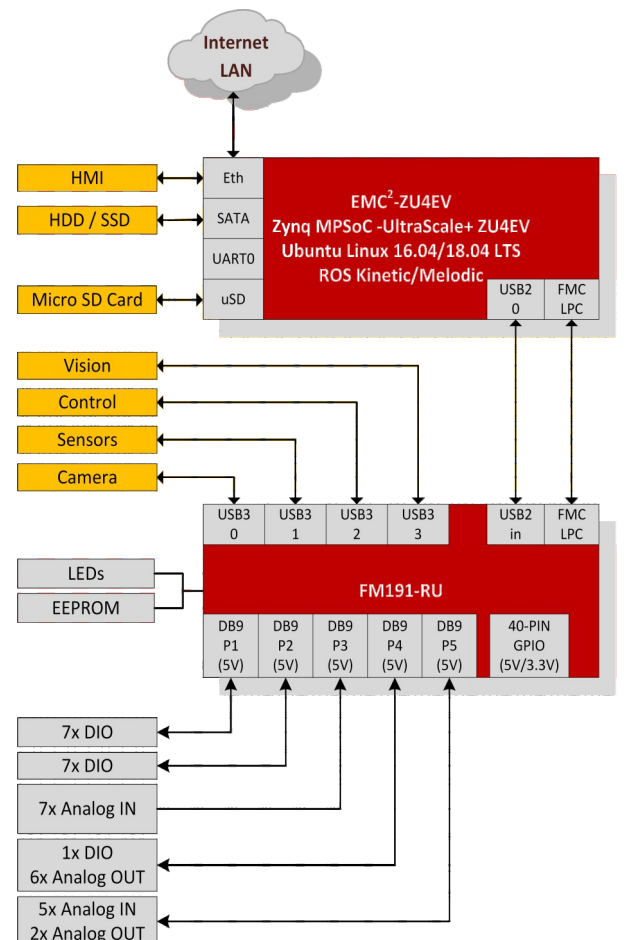


The SoC provides standard connectivity (SPI, RS232, I2C, USB, GigE, PCIe, etc), ARM-based processing which is used to run Ubuntu Linux OS and ROS Melodic, memory interfaces and Programmable Logic used for hardware acceleration and GPIO.

- High performance, low power consumption (24V @ 1.1A)
- Will be fully compatible with the Xilinx reVision stack.
- Raspberry PI and Arduino compatible
- MQTT and OpenCV compatible
- ROS compatible, ROS2 ready and HIPPEROS ready
- Compatible with a wide range of commercially available sensors and actuators
- Support for the most popular neural networks including YOLO, AlexNet, GoogLeNet, CAFFE, DarkNet, VCG, SSD, TensorFlow and FCN.

Optimized implementations for CNN network layers, required to build custom neural networks (DNN/CNN) = Xilinx NDDDK™

www.sundance.com/VCS-1

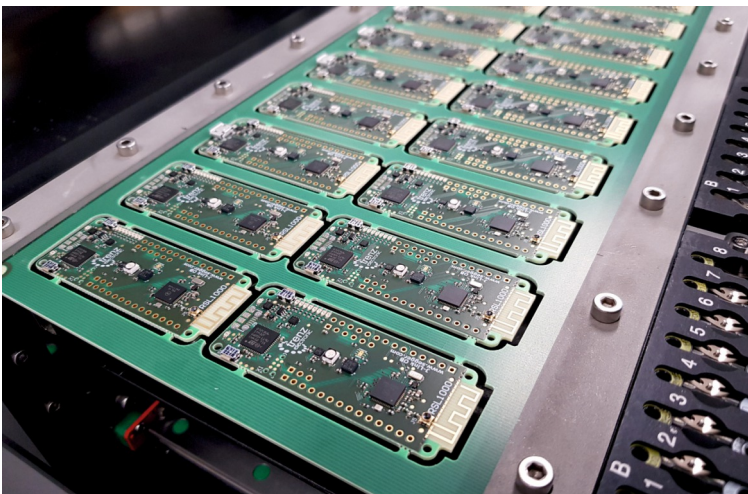


Trenz Electronic SMD In-house Production

Full SMT production since 2014, smallest SMD part 01005



- Full SMT production since 2014
- Smallest SMD part 01005
- Two Mycronic MY700 (direct solder printing)
- Inline PCB feeder Mycronic MY300 and MY100, pick and place
- Mycronic automatic SMD storage system
- Mycronic VI Technology 5K 3D (AOI)
- Two IBL vapor phase ovens
- Two PI series 3D SPI (Solder Paste Inspection)
- PCB cleaning system (ÖKO 1000)



cronologic offers a family of high-resolution high-throughput PCIe analog-to-digital converters (ADCs)

- Up to 4 analog input channels
- Additional digital trigger and/or gating inputs
- PCIe x4 or x8 half-size boards
- Gross DMA-bandwidth up to 8 GByte/s
- Arbitrary board combinations can be synchronized
- LEMO 00 series input connectors (adapter cables to SMA connector available)
- The DC-offset can be shifted to make optimal use of the ADC range for either positive or negative pulses

	Ndigo6G-12			Ndigo5G-10			Ndigo5G-8			Unit
Analog channels	4	2	1	4	2	1	4	2	1	-
ADC resolution	12			10			8			Bits
Max. sampling rate	1600	3200	6400	1250	2500	5000	1250	2500	5000	Msps
Bandwidth	TBD			1000			1000			MHz
Max. individual sample length	110			26			26			µs
THD	67*			58			58			dBc
SNR	54*			51	50	50	45			dBc
SFDR incl.	72*	69*	66*	61	60	60	58			dBc
SFDR excl.	72*	69*	68*	74	64	63	57			dBc
SINAD	53*			50	48	48	45			dBc
ENOB	8.6*			8.0	7.7	7.7	7.2			-
Input type and coupling	AC single ended			AC single ended			AC single ended			-
PCIe lanes	Gen3 x8			Gen1 x4			Gen1 x4			-
PCIe bandwidth	3000*			800			800			MB/s

*preliminary data

Ndigo Series

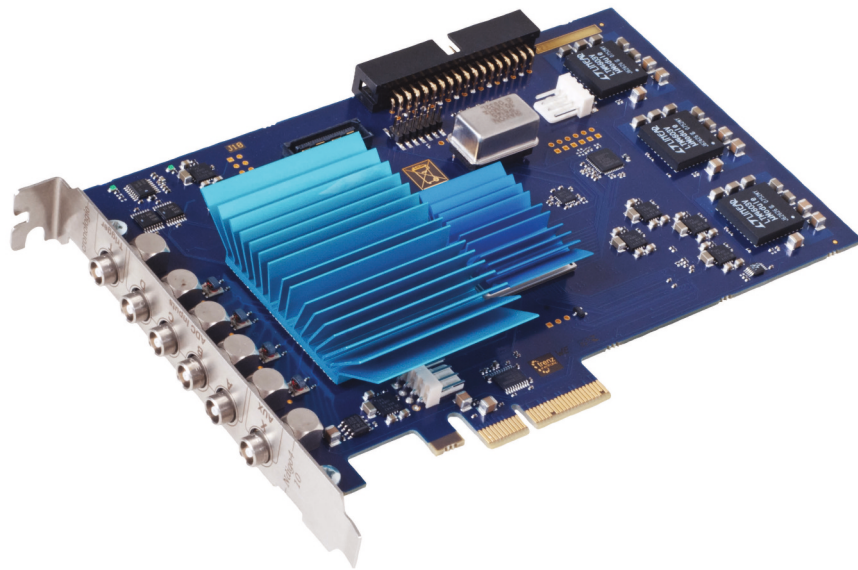
It has been designed to acquire trains of pulses at high repetition rates. Employing an onboard zero suppression, the pulse data is recorded with pre- and post-cursors, omitting the data inbetween to reduce the requirements on bandwidth and pulse processing or averaging. There is no deadtime between samples as long as the sustained rate is lower than the available PCIe bandwidth. The first available instances of this series provide 5 Gsps at 10-bit resolution and 250 Msps at 14-bit resolution.

These boards are ideally suited for applications like

- Mass Spectrometry
- Photon Counting
- Lidar
- NMR

Time to digital converter

Cronologic has a wide series of high performance time to digital converters (TDC) with resolutions starting at 3ps. The current lineup contains boards with up to 10 channels, a new series with up to 64 channels will be introduced in 2020.



Time Tagger

Cronologic presents a new series of low cost, mid resolution time-to-digital converters.

Two new boards are available featuring 500ps to 1ns single shot resolution at highest data bandwidths.

Time Taggers are ideally suitable in applications that do not require highest single shot timing resolution, but high data acquisition rates and lowest multiple hit deadtime. These include certain types of mass spectroscopy, time correlated single photon counting (TCSPC) and frequency counting applications.



Official Trenz Electronic Distributor List as of September 2020

There is a current list online at <http://trenz.org/distri>

Worldwide

Digi-Key Electronics

Web: www.digikey.com

E-mail: sales@digikey.com



Mouser Electronics, Inc.

Web: www.mouser.com

E-mail: sales@mouser.com



ARROW Electronics

Web: www.arrow.com

Contact via form on website



RS Components GmbH

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E-mail: bestellung@rs-components.com



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