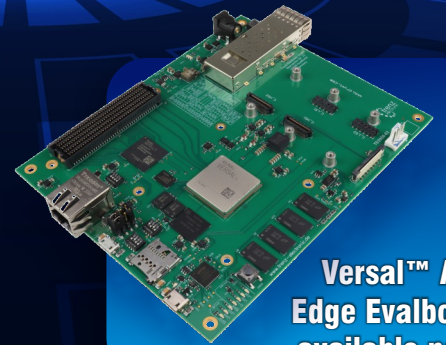# TRENZ ELECTRONIC CATALOGUE

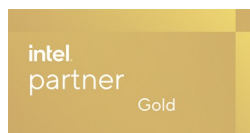## Electronic Design Service

Development, manufacturing and supply of FPGA & SoC modules and customized turnkey solutions

Versal™ AI Edge Evalboard available now!

updated February 2024

intel partner Gold

AMD Adaptive Computing Partner PREMIER

www.trenz-electronic.de

shop.trenz-electronic.de

info@trenz-electronic.de

trenz electronic GmbH

Forging **FPGA** Frontiers

Company Profile

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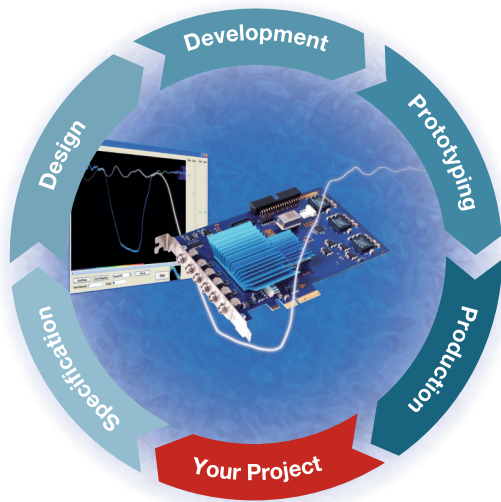
We are particularly specialized in the design of high-speed data acquisition, high-accuracy measurement and embedded digital signalprocessing systems based on FPGA and CPU architectures.

Many of our products are compatible with some wide-spread 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 (Electronic Manufacturing Service) 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

Index

Product availability

In our own behalf

In recent years, we have been confronted with some major problems due to many component discontinuations and deteriorating delivery times (allocations).

Trenz Electronic will not discontinue any series as long as the key components are available. As part of this obsolescence management, we have had to revise many boards in order to provide you, our customers and partners, with a reliable and future-oriented supply chain.

Since the beginning of the year, we have finally been able to gradually build up stocks again and reduce the standard delivery time for our entire portfolio to six months.

AM0030 Versal™ AI Edge Andromeda SoM
AMD Versal™ AI Edge VE2302 device

trenz electronic GmbH

AMD VERSAL AI Edge

PREVIEW

4 x 5.6 cm form factor

http://trenz.org/am0030-info
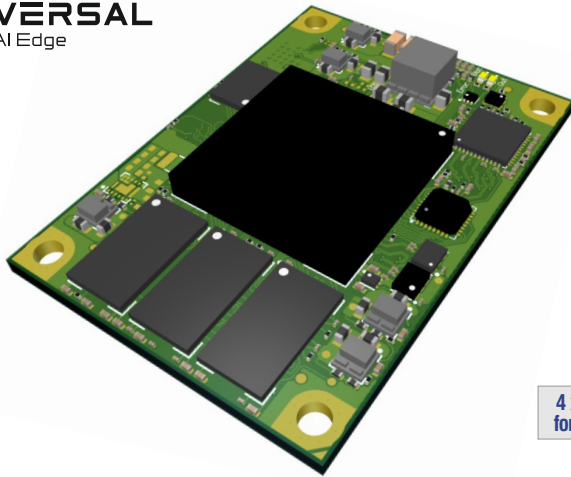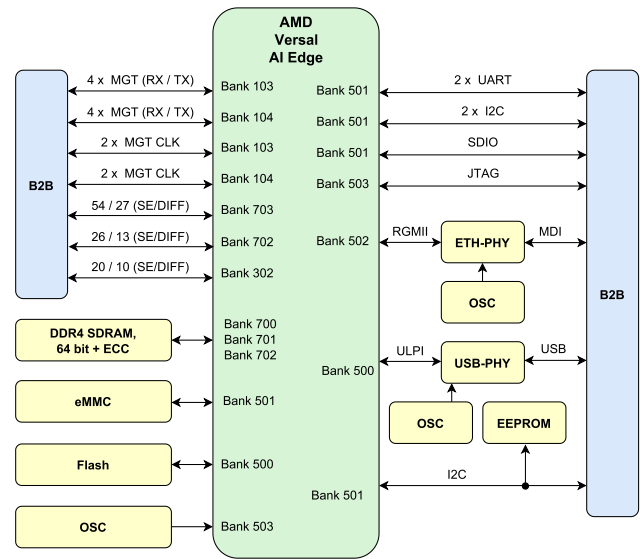
Device list	Pin Packages	Connectors	SDRAM max	Flash	e.MMC	EEPROM	Ethernet	USB	Other Features
Versal™ AI Edge VE2302	A784	80-pins XPIO, 20-pins HDIO, 2 x Samtec ADF/ADM B2B	8 GB DDR4	64 MB QSPI	max. 64 GB	2Kbit with MAC-Adress	1 Gbit Transceiver	USB2.0 Transceiver	Clock Generator for PS, PHY and DDR4, 8 GTYP Transceiver, UART, I²C, SDIO

TEI0187 Series
Intel® Agilex® 5E, LPDDR4 SDRAM, Flash, Ethernet, USB

intel.

trenz electronic GmbH

PREVIEW

5,2 x 7,6 cm form factor

http://trenz.org/tei0187-info
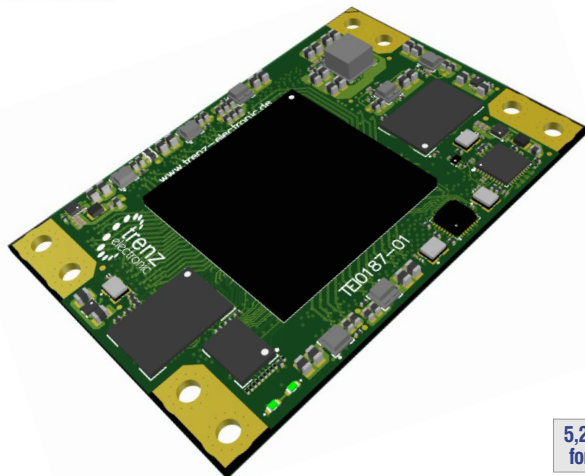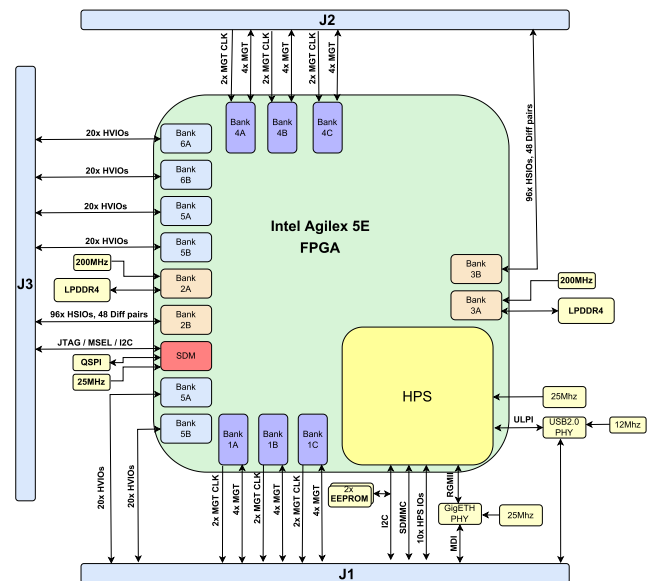
Device list	Pin Packages	Connectors	Flash	SDRAM	Ethernet	USB	I/Os	Other Features
Intel® Agilex® 5E	B32A	3 x 240pin Samtec ADM6	256 MB	2 GB LPDDR4	1 Gbit PHY	USB2.0 PHY, Support USB3.1	331/96/19 (I/Os/DIFF. Pairs/HPS IOs)	12 V Power Supply, 2 x EEPROM, 24x up to 28 GB Transceiver

TE0950 Versal™ AI Edge Evalboard
Evaluation Board with AMD Versal™ AI Edge

trenz electronic GmbH

AMD VERSAL AI Edge

15 x 12 cm form factor
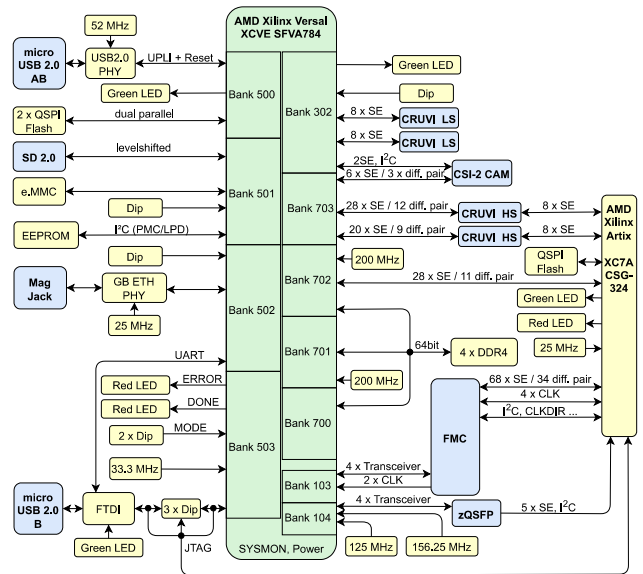
http://trenz.org/te0950-info

Device list	Pin Packages	Connectors	SDRAM max	Flash	e.MMC	Ethernet	USB	Other Features
Versal™ AI Edge VE2302	A784	zQSFP, 2 x CRUVI HS, 2 x CRUVI LS, CSI-2, FMC	8 GB DDR4	128 MB SPI	32 GB	1 Gbit RJ45	USB2.0, JTAG + UART	AMD Artix™7 FPGA as configurable Levelshifter, EEPROM with MAC-Address, 2 LEDs, push button, dip switches, reset button

---

TEG2000
Cologne Chip GateMate A1

trenz electronic GmbH

Cologne Chip

4 x 5 cm form factor

http://trenz.org/teg2000-info
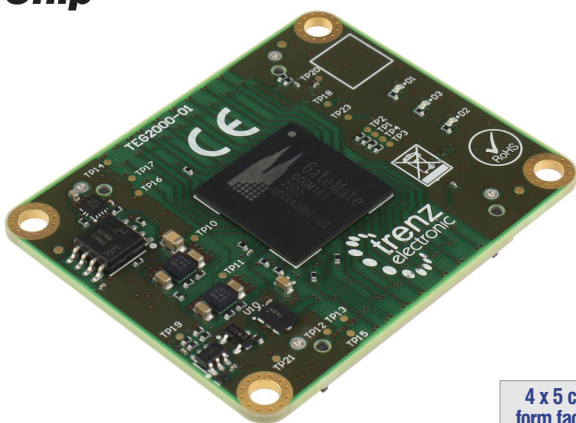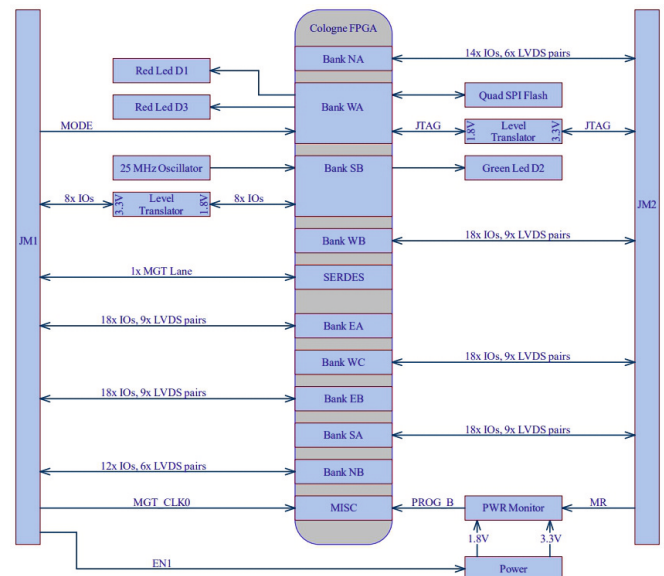
Device list	Interface	Flash	On Board	Other Features
GateMate CCGM1A1	Plug-on-Module with 2 x 100-Pin Razor Beam B2B connector, Diverse I/O- and LVDS configurations	16 MB QSPI	25 MHz Clock Oscillator, Level Shifters	All power supplies on board

PREVIEW

6.4 x 8 cm form factor

http://trenz.org/am0070-info
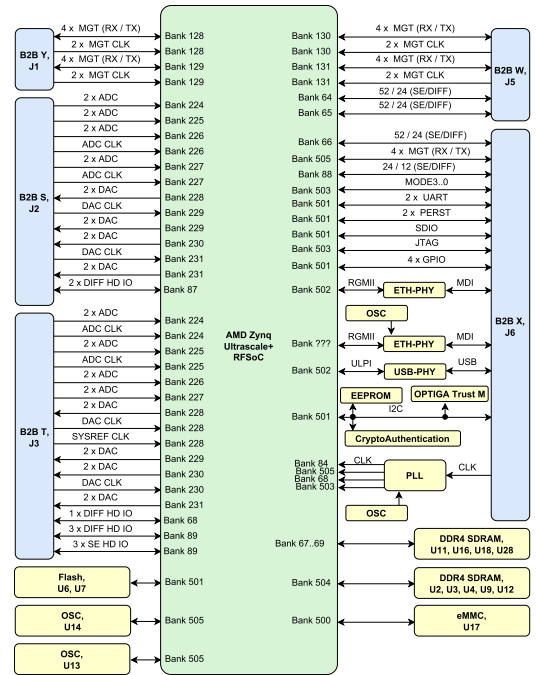
Device list	Connectors	SDRAM max	Flash	e.MMC	Ethernet	USB	Other Features
ZU29DR, ZU39DR, ZU49DR	5 x Samtec ADM6 4 x 60-pin	4 GB DDR4 64-bit (PS) with ECC 8 GB DDR4 64-bit (PL)	2 x 64 MB	8 GB	2 x 1 Gbit	USB2.0	OPTIGA Trust M, Crypto Authentication, Oscillator

NEW **TE0825 Series**
AMD Zynq™ UltraScale+™ MPSoC, Automotive, DDR4, Flash, EEPROM

trenz electronic GmbH

PREVIEW

5.4 x 7 cm form factor

http://trenz.org/te0825-info
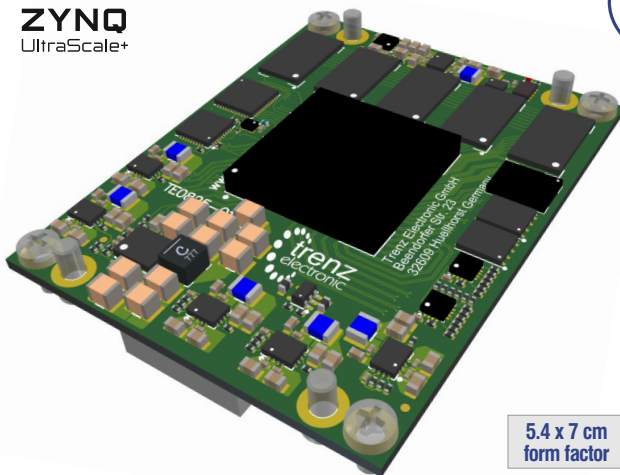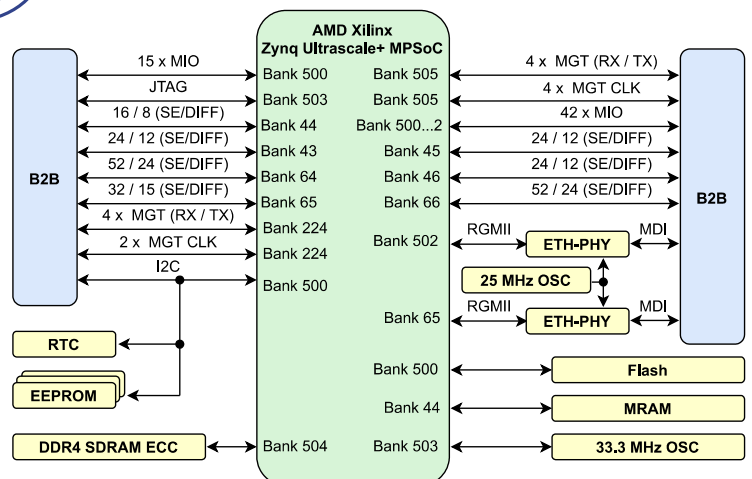
Device list	Connectors	SDRAM	Flash	EEPROM	Ethernet PHY	Total I/O	Gbit Transceiver	Other Features
ZU2, ZU3, ZU4, ZU5	2 x Samtec ADM6, 1 x Samtec UMPT, 4 x 60 pin	8 GB DDR4 with ECC	256 MB	64 kByte, 2 x with MAC address	2 x 1 Gbit	136 PL HP + 88 PL HD 57 PS MIO	4 x GTR + 4 x GTH	real time clock, Oscillator, power connector (UMPT), ETH, JTAG

TE0717 Series
AMD Spartan™7, HyperRAM, Flash, 100MHz Oscillator

AMD SPARTAN7

2.5 x 3.5 cm
form factor

http://trenz.org/te0717-info
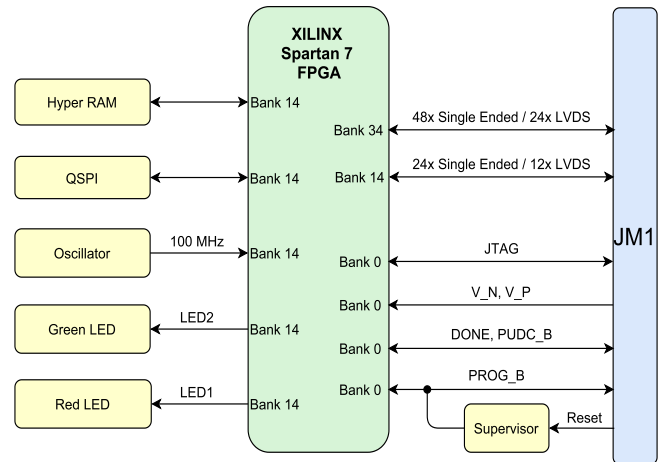
Device list	Connector	HyperRAM	Flash	Other Features
S6, S15, S25, S50	1 x Samtec 100-pin LSHM	64 Mbit	64 Mbit	Baseboard available, oscillator 100 MHz, green and red LED, single supply

---

NEW

TE0806 Series
AMD Zynq™ UltraScale+™ MPSoC, DDR4 (PS + PL domain), Flash, Ethernet, USB

AMD ZYNQ UltraScale+

PREVIEW

5.5 x 7.6 cm
form factor

http://trenz.org/te0806-info

Device list	Connec-tors	SDRAM max	Flash max	e.MMC max	Ethernet PHY	USB PHY	Total I/O	Gbit Trans-ceiver	Other Features
ZU4, ZU5, ZU7, CG, EG, EV support, 900 Pin packages	2 x Samtec ADM6	8 GB DDR4 64-bit (PS) with ECC 4 GB DDR4 32-bit (PL)	512 MB	64 GB	2 x 1 Gbit	USB2.0 OTG	48 PI HD + 52 PL HP 14 MIOs + I2C	4 x GTR + 16 x GTH	Transceiver clock in-/outputs, 2 x MAC address serial EEPROM, single 5-12V power required

TE0865 Series

AMD Zynq™ UltraScale+™ MPSoC, DDR4, Flash, Ethernet, USB

AMD ZYNQ UltraScale+

7.5 x 10 cm form factor
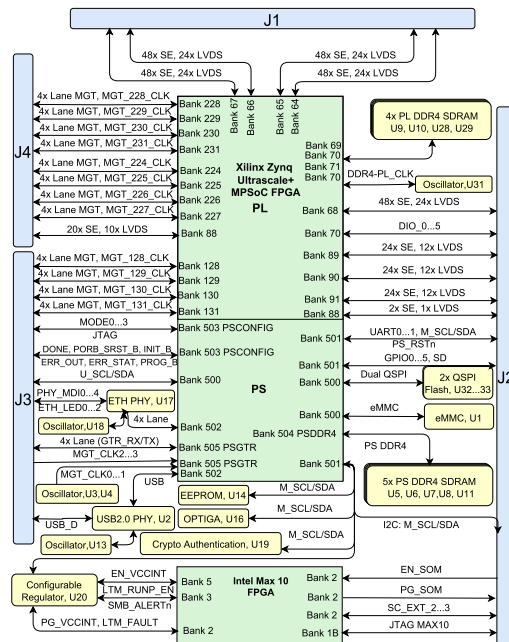
http://trenz.org/te0865-info

Device list	Pin Packages	Connectors	SDRAM max	Flash	Ethernet PHY	Total I/O	Gbit Transceivers	Other Features
ZU11, ZU17, ZU19	C1760	4 x Samtec ADM6 4 x 60-pin	8 GB DDR4 64-bit (PS) with ECC, 8 GB DDR4 64-bit (PL)	2 x 64 MB	1 Gbit	240 PL HP 96 PL HD 21 MIOs	32 x GTH, 16 x GTY, 4 x GTR	USB PHY, e.MMC, 12V single supply

TEI0050 Series

Intel® Cyclone® V, SDRAM, Flash, EEPROM

2.5 x 7.07 cm form factor

http://trenz.org/tei0050-info
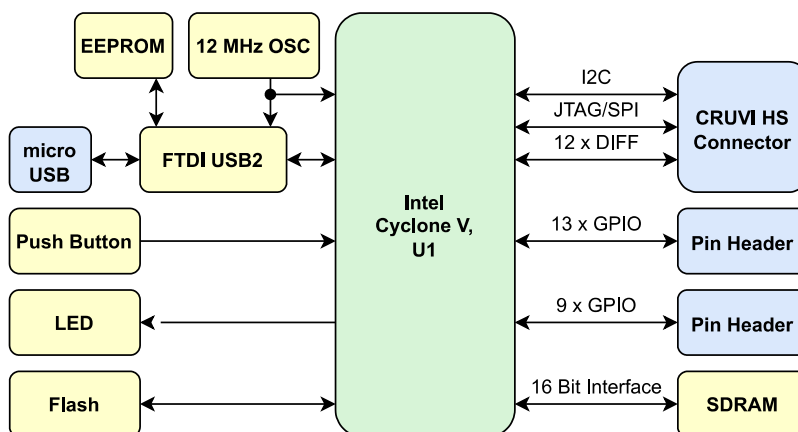
Device list	Pin Package	Connectors	SDRAM	Flash	Other Features
Intel® Cyclone® V	U15 Ultra FineLine BGA 324 Pins	CRUVI, 2 x 14 Pin Header	8 MB	up to 256 MB possible	USB-to-JTAG/GPIO-FTDI, user push buttons and LEDs

TEL0003 Series
Lattice CertusPro™-NX, CRUVI, DRAM, Flash

LATTICE SEMICONDUCTOR.

trenz electronic GmbH

Lattice CertusPro-NX
LFCPNX-100 FPGA

Left blocks		Right blocks
32 MByte QSPI, U4 → Bank0	Bank5 →	SFP, J12
LED,D1..8 → Bank1	Bank5 →	CSI, J4
CRUVI LS, J9 — X0...X7 → Bank1	Bank7 →	CRUVI HS, J8
Pin Header, J11 — I2C / UART → Bank1	SerDes0...3 →	100 MHz CLK, Y2
Pin Header, J7 — JTAG →	SerDes0...3 →	PCIe x4
Micro USB2, J5 — JTAG/UART FTDI, U5 — JTAG/UART → Bank1	SerDes4...7 / Bank6 / Bank4 — DP0...3 / LA24...33 / LA00...23 →	FMC LPC, J2
EEPROM, U6 / 12 MHz CLK, U6 → Bank1	Bank3 →	32 MByte RPC, U7, U11
Micro USB 3.0, J3 — FT601, U10 → Bank2	Bank3 →	Push Button, S1, BTN1...5
30 MHz XTAL, Y1		

10.7 x 16.8 cm form factor

http://trenz.org/tel0003-info

Device list	On-Board	DRAM	Flash	Interface	Other Features
CertusPro™-NX LFCPNX-100	USB3.0 to FIFO Bridge USB to FIFO FTDI	2 x 32 MB RPC	32 MB QSPI	CRUVI, PCI x 4, FMC (MGT/GPIO/JTAG/I2C), SFP+, USB3.0, USB2.0 (JTAG+UART), 3 x Pin Header	Oscillator, user LEDs, push buttons, DIP Switch, EEPROM

TEL0004 Series
Lattice Avant™ Evaluation Board, CRUVI, DRAM, Flash

LATTICE SEMICONDUCTOR.

trenz electronic GmbH

Lattice Avant-E
FPGA LAV-AT-E70

Left blocks		Right blocks
CRUVI LS A, J20 → Bank0	Bank3 / Bank12 →	CSI-2 CAMERA0, J2
CRUVI HS X, J13 → Bank0 / Bank5	Bank3 / Bank12 →	CSI-2 CAMERA1, J5
CRUVI LS B, J15 → Bank2	Bank3 / Bank12 →	CSI-2 CAMERA2, J3
CRUVI HS Y, J12 → Bank4 / Bank14	Bank3 / Bank13 →	CSI-2 CAMERA3, J6
CRUVI LS C, J14 → Bank0	Bank4 / Bank13 →	CSI-2 CAMERA4, J7
CRUVI HS Z, J11 → Bank4 / Bank14	Bank4 / Bank13 →	CSI-2 CAMERA5, J9
RJ45, J4 — ETH PHY, U6 → Bank9	Bank1/Bank2 — FTDI, U17 — EEPROM, U18 →	MicroUSB, J8 / 12MHz, U19
25MHz, U7 → Bank5	Bank14 — FTDI UART, U21 →	MicroUSB, J18
RJ45, J1 — ETH PHY, U3 → Bank9	Bank14 →	LEDs, LED0..7
HDMI, J10 — HDMI Transmitter, U6 → Bank6	Bank5 →	Push Buttons, BTN1..5
LPDDR4, U2 → Bank7 / Bank8	Bank5 →	Slide Switch, S1..2
LPDDR4, U5 → Bank10 / Bank11	Bank9 →	EEPROM, U9,U11
100MHz, Y1 → Bank10		

11 x 16 cm form factor

http://trenz.org/tel0004-info

Device list	SDRAM	Flash	Interface	Other Features
Lattice Avant™ AT-E (LAV-AT- E70)	2 x 8 Gbit LPDDR4	32 MB SPI/QUAD Boot	2 x GBit Ethernet, HDMI Transmitter, 2 x Micro-USB connector, 6 x MIPI CSI-2, 3 x CRUVIs	user LEDs, push buttons, Slide Switch, 2 x EEPROM with MAC address

TE0830 Series (COM-HPC™ PICMG Standard)
AMD Zynq™ UltraScale+™ Module, ZU11EG up to ZU19EG, 12 x 12 cm (Client Size B)

COM-HPC™ is the new released PICMG standard for high-performance Computer-on-Modules (COMs). The pinout and majority of the functionality were recently officially approved.

12 x 12 cm form factor

http://trenz.org/te0830-info
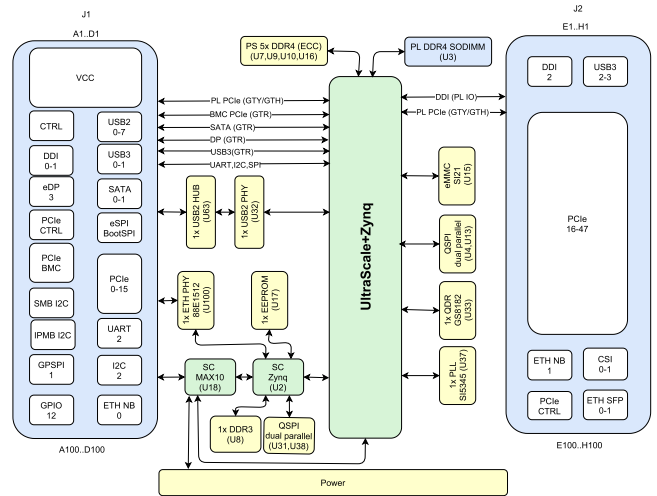
Device list	Pin Packages	Connectors	SDRAM max	Gbit Transceivers	Other Features
ZU11, ZU17, ZU19	FFVC1760	2 x 400 Pin COM-HPC	bis 8 GB DDR4 (PS) with ECC bis 16 GB DDR4 (SODIMM) (PL)	32 x GTH, 16 x GTY, 4 x GTR	1 GBit ETH PHY, USB PHY, e.MMC, System Controller, CLK Management, diverse IOs, 12V single supply

TEI1000 Series
Intel® Stratix® 10 SX or GX, SDRAM, Flash, MAX10 System Controller

6 x 8 cm form factor

http://trenz.org/tei1000-info
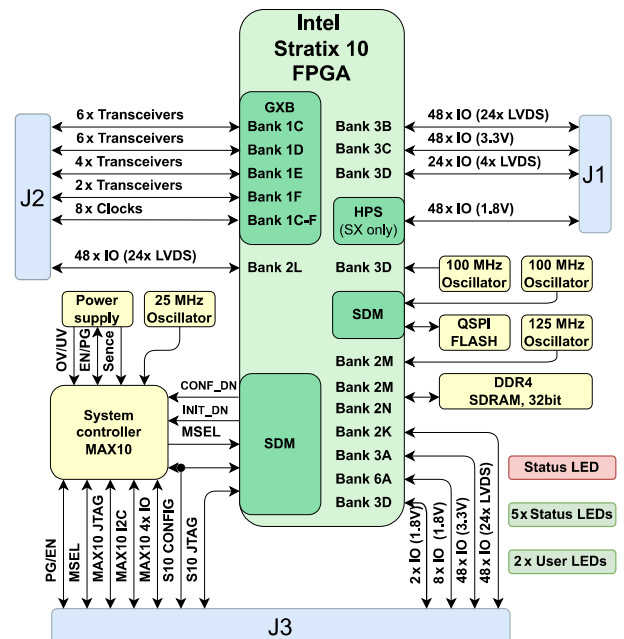
Device list	Connector	SDRAM	QSPI Flash	Gbit Transceivers	Total IOs	Other Features
Stratix® 10 SX or GX	3 x 240 pin BGA	max.2 Gbyte DDR4	512 Mbit	18 x GXT	250 x PL 48 x CPU	MAX® 10 System Controller, Status and User LEDs, 1.8V, 3.3V and variable IO

TE0763 Series
AMD Artix™7 FPGA, 200K, DDR3L, Flash

AMD ARTIX 7

4.05 x 4.75 cm form factor

http://trenz.org/te0763-info
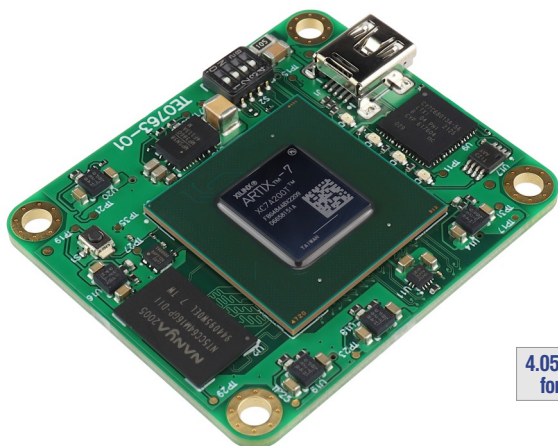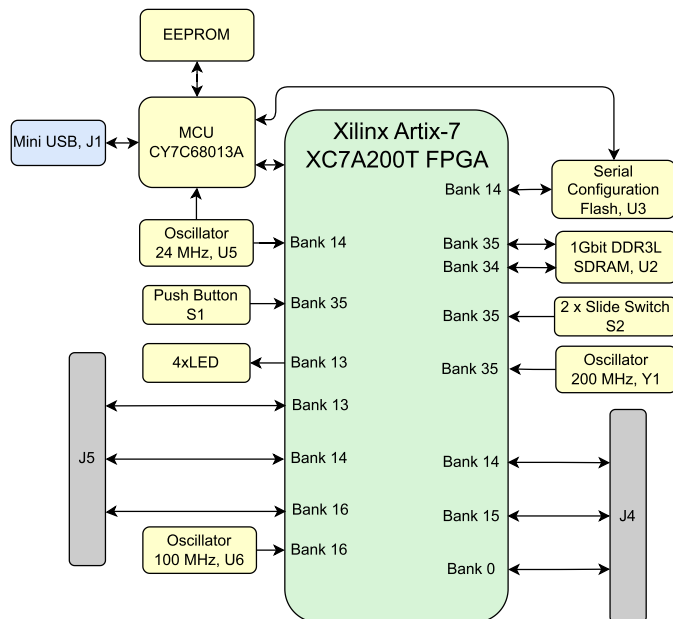
Device list	On-Board	DRAM	Flash	Interface	Other Features
200T	HS-USB Microcontroller	125 MB DDR3L SDRAM	32 MB SPI/QUAD Boot	2 x 80 pin B2B connectors, B2B USB, Reset IN, 100 x IOs, 6 x CLK IN, FPGA JTAG	user LEDs, push buttons, DIP Switch,

TEC0217 Series
Micromodule with Artix™/Kintex™ Ultrascale+

TEC0217 is an FPGA module optimized to provide high MGT performance at relatively low cost. All 12 or 16 MGT lanes are available on the B2B connector. Of these, 4 lanes can optionally be routed to an onboard intel Thunderbolt 4 device controller JHL7440 to access the board via PCI over USB. An interface like this can connect to any Thunderbolt port and to USB ports that support PCIe over USB.

5.2 x 9.6 cm form factor

http://trenz.org/tec0217-info
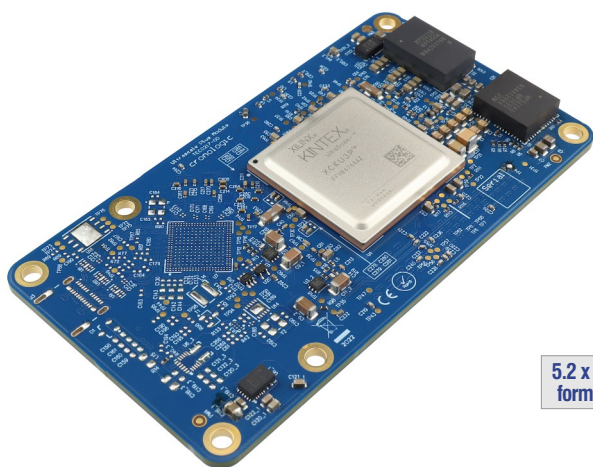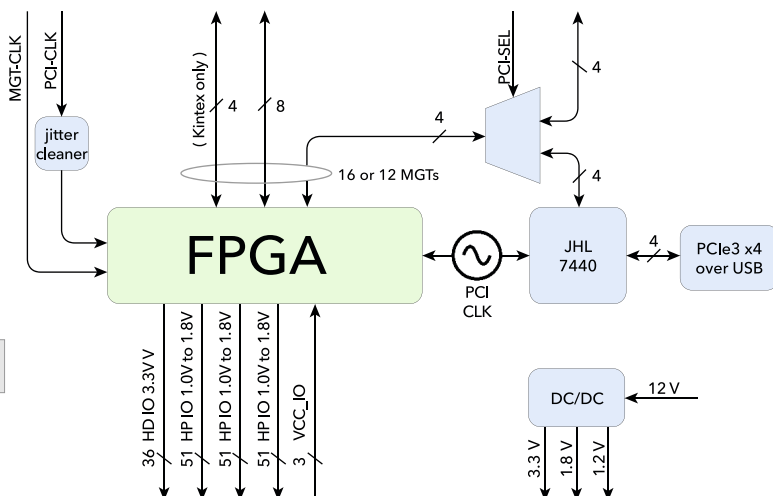
Device list	MGT count	MGT speed	MGT Type	PCI	System Logic Cells (K)	UltraRAM (Mb)	DSP Slices	HP IO (3 Banks with individually selectable IO voltage)	HD IO 3.3V
AU10P, AU15P, AU20P, AU25P, KU3P, KU5P	12-16	16.3 - 32.75 Gbps	GTH GTY	PCIe4x8 PCIe3x8 PCIe3x16	96 up to 475	only for KU3P (13.5) and KU5P (18.0)	400 up to 1.824	153	58 in 29 differential pairs

TE0710 Series
AMD Artix™7, DDR3, Flash, 2 x 100 Mbit Ethernet, EEPROM
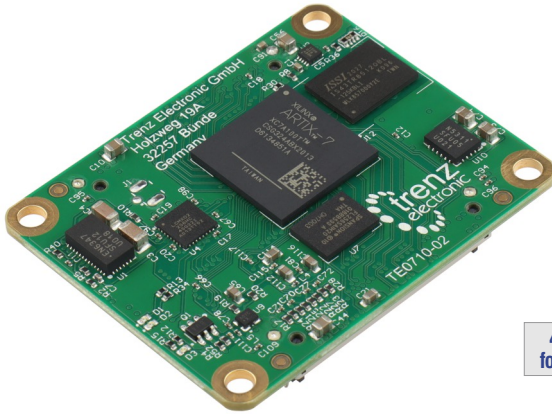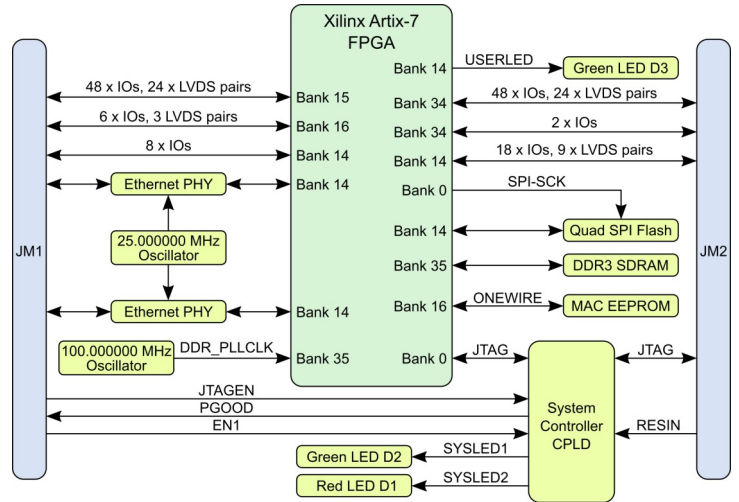
4 x 5 cm
form factor

http://trenz.org/te0710-info

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

TE0711 Series
AMD Artix™7, Flash, USB, FTDI USB to UART/FIFO bridge, high pin count

4 x 5 cm
form factor

http://trenz.org/te0711-info
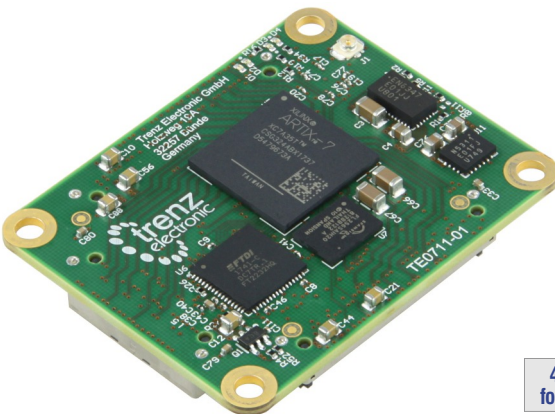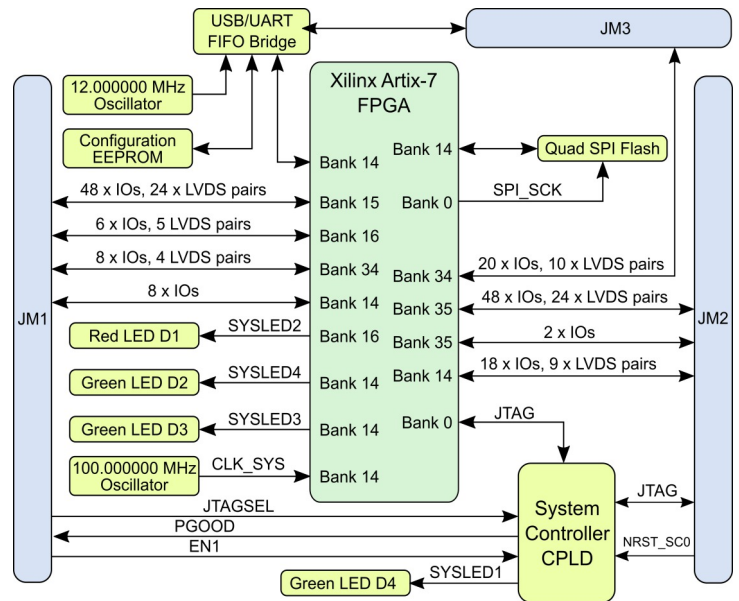
Device list	Connectors	Flash	MEMS Oscillator	USB PHY	Total I/O	Other Features
35T, 50T, 75T, 100T	3 x Samtec LSHM	32 MB	100 MHz	USB2.0 UART/FIFO	178 (84 differential pairs)	4 LEDs, single supply

TE0712 Series
AMD Artix™7, DDR3, Flash, Ethernet, 4 x GTP Transceiver
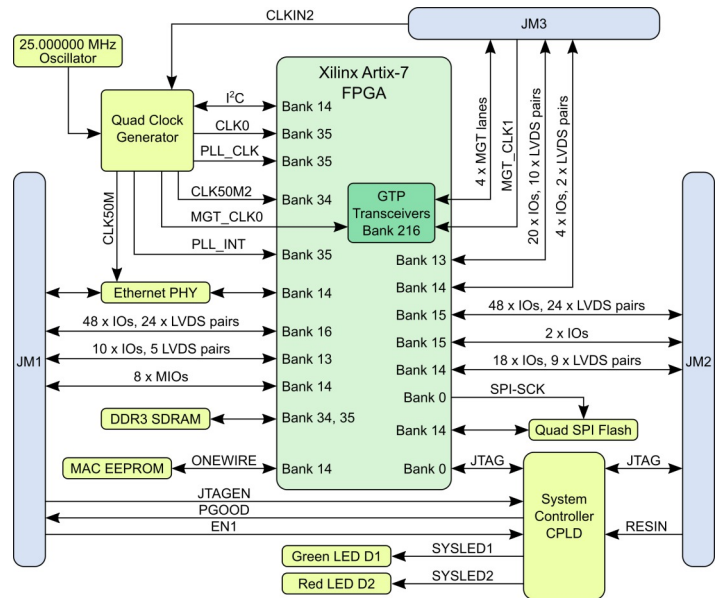
4 x 5 cm
form factor

http://trenz.org/te0712-info

Device list	Connectors	SDRAM max	Flash	EEPROM	Ethernet PHY	Total I/O	Gbit Transceivers	Other Features
75T, 100T, 200T (with restrictions: 15T, 35T, 50T)	3 x Samtec LSHM	1 GB DDR3	32 MB	MAC Address	100 Mbit	158	4 x GTP	Programmable clock generator, single supply

TE0713 Series
AMD Artix™7, DDR3L, Flash, USB3.0 to FIFO Bridge, 4 x GTP Transceiver

4 x 5 cm
form factor

http://trenz.org/te0713-info
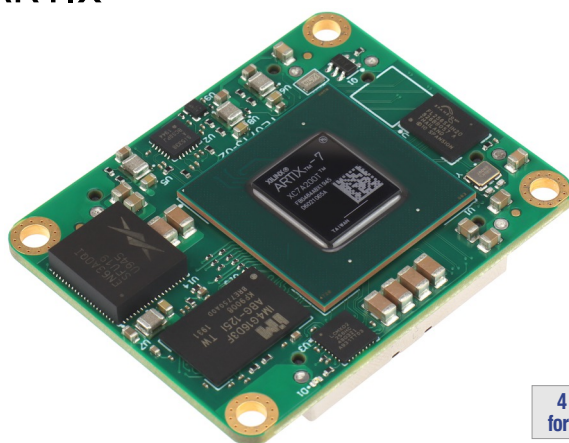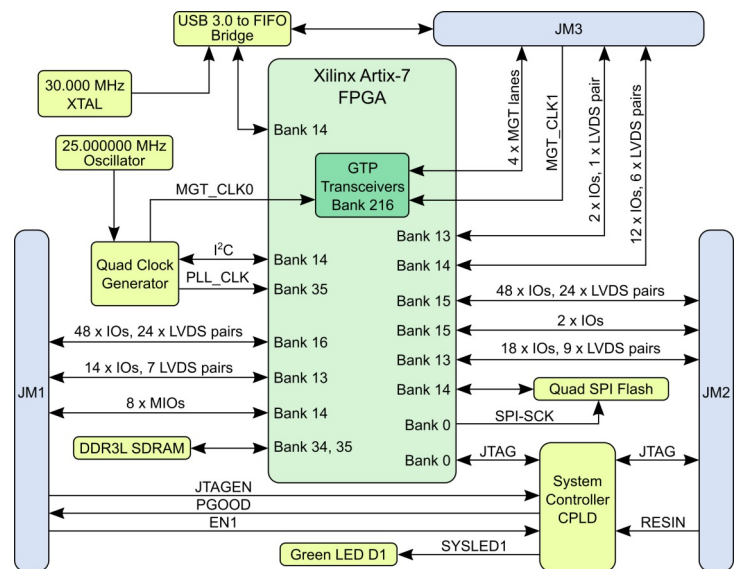
Device list	Connectors	SDRAM max	Flash	USB PHY	Total I/O	Gbit Transceivers	Other Features
75T, 100T, 200T (with restrictions: 15T, 35T, 50T)	3 x Samtec LSHM	1 GB DDR3L	32 MB	USB3.0	152	4 x GTP	Programmable clock generator, single supply

TE0715 Series
AMD Zynq™7000, DDR3, Flash, Ethernet, USB, 4 High Speed Serial Transceivers
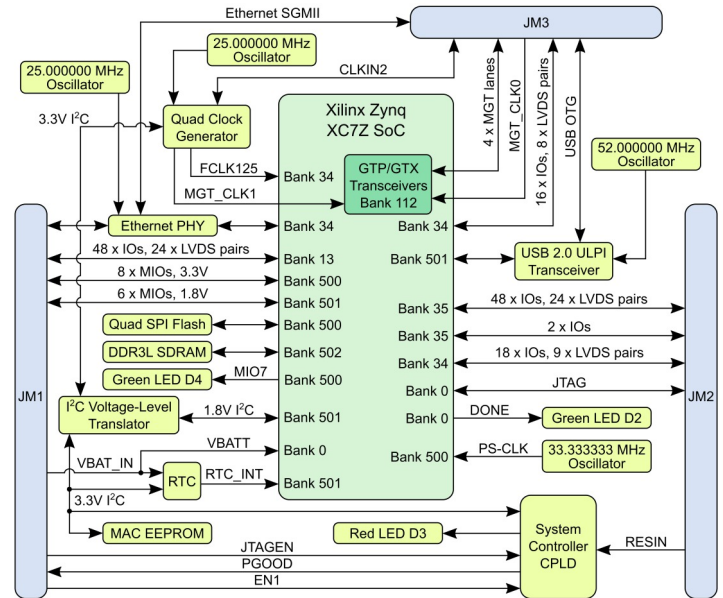
AMD ZYNQ

trenz electronic GmbH

4 x 5 cm form factor

http://trenz.org/te0715-info

Device list	Connectors	SDRAM max	Flash	Ethernet PHY	USB PHY	Total I/O	Gbit Transceivers	Other Features
Z-7015, Z-7030, Z-7012S	3 x Samtec LSHM	1 GB DDR3	32 MB	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
AMD Zynq™7000, DDR3, Flash, Ethernet, USB, e.MMC, Automotive Grade available
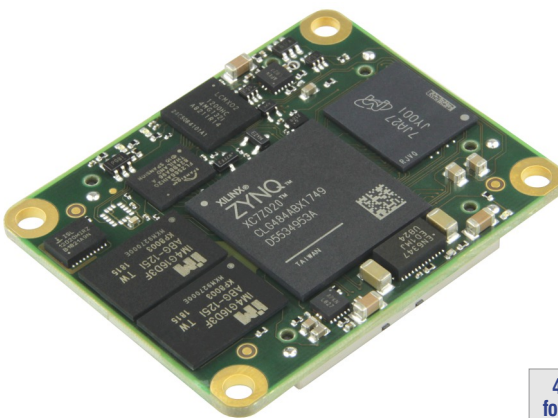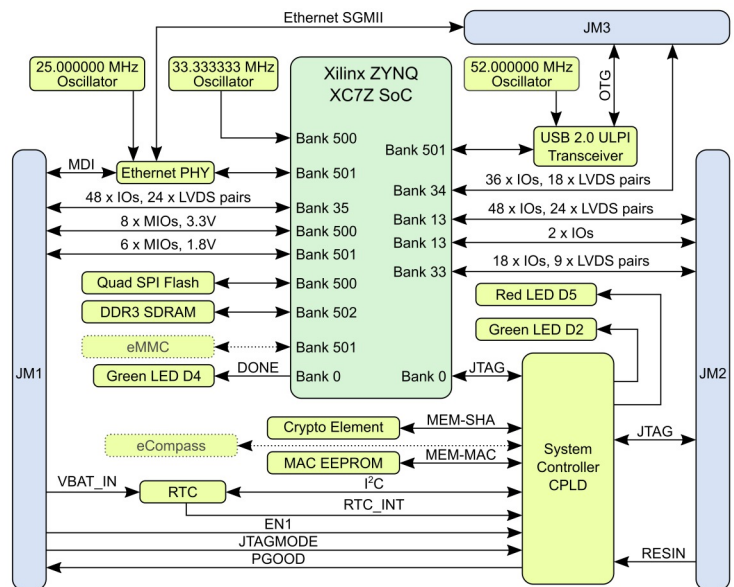
AMD ZYNQ

trenz electronic GmbH

4 x 5 cm form factor

http://trenz.org/te0720-info

Device list	Connectors	SDRAM max	Flash max	e.MMC max	Ethernet PHY	USB PHY	Total I/O	Other Features
Z-7020, Z-7014S, XA7Z020-1CLG484Q	3 x Samtec LSHM	1 GB DDR3	64 MB	32 GB	1 Gbit	USB2.0	152 + 14 MIO	Real time clock, MAC address, 2k serial EEPROM, 3 user LEDs, single supply

TE0741 Series
AMD Kintex™7, Flash, 8 High Speed Serial Transceivers, 25 MHz Oscillator
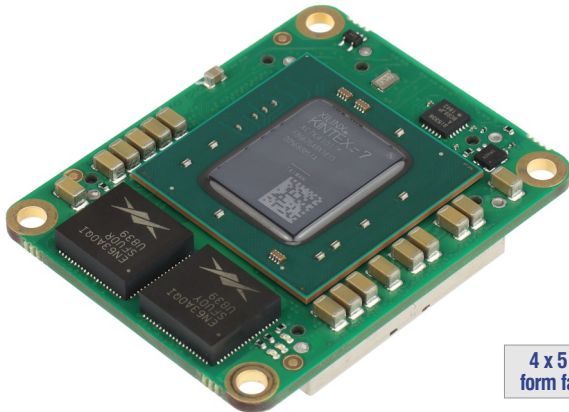
http://trenz.org/te0741-info
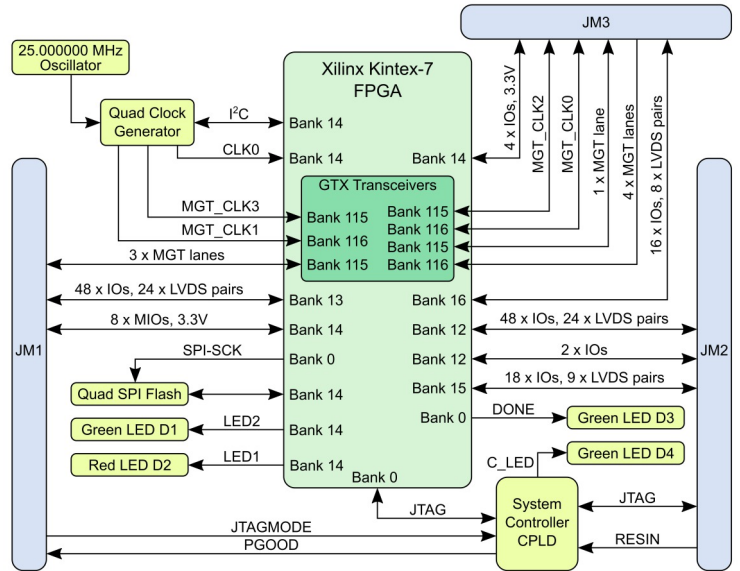
Device list	Connectors	Flash	Total I/O	Gbit Transceivers	Other Features
70T, 160T, 325T, 410T	3 x Samtec LSHM	32 MB	144 (94 for 70T variant)	8 x MGTs	Programmable clock generator, single supply

TE0841 Series
AMD Kintex™ UltraScale™, DDR4, Flash, 8 x GTH Transceiver
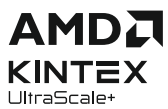
http://trenz.org/te0841-info
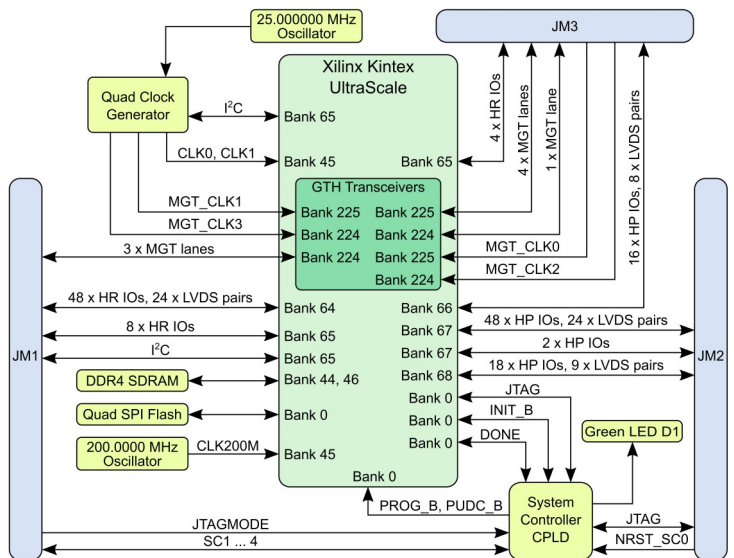
Device list	Connectors	SDRAM max	Flash	Total I/O	GBit Transceivers	Other Features
KU035, KU040	3 x Samtec LSHM	4 GB DDR4	64 MB	60 x HR I/Os 84 x HP I/Os	8 x GTH	Programmable clock generator, single supply

TE0812 Series
Latest MPSoC chip technology in space, designed for cubesat missions

AMD ZYNQ UltraScale+

Radiation hardened

9 x 9 cm form factor

http://trenz.org/te0812-info
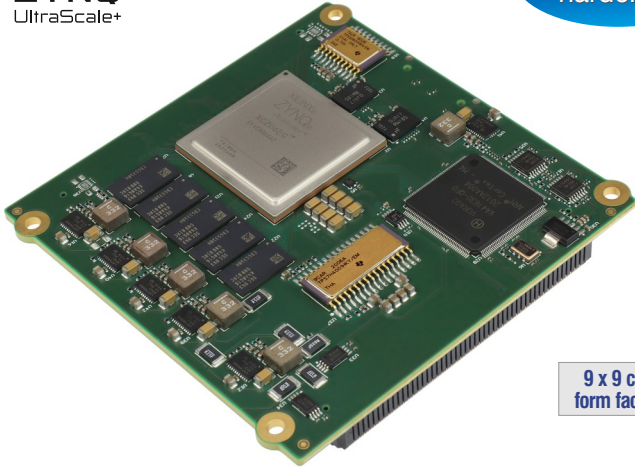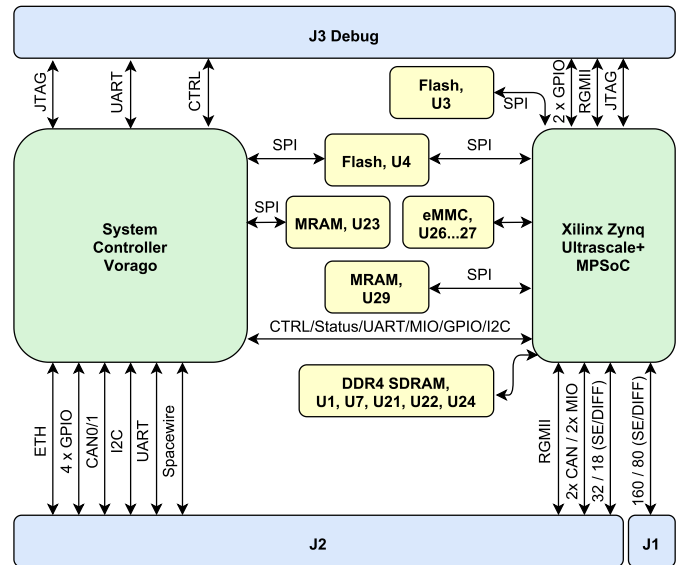
Device list	Pin Packages	Connectors	SDRAM max	e.MMC	Flash	Total I/O	Gbit Transceivers	Other Features
ZU6, ZU9, ZU15	C900	2 x B2B Samtec APM6 1 x Debug Samtec LSHM	4 GB DDR4 with ECC	2 x 32 GB	2 x 128 MB	127	16 (12 x PL; 4 x PS)	2 x 4 MByte MRAM, on board Vorago VA41630, ETH, 2x Analog input, UART, 2 x CAN, PPSIn/PPSOut, I2C, 12V power supply

AM0010 Andromeda MPSoC Series
AMD Zynq™ UltraScale+™ MPSoC, DDR4, Flash, Ethernet, USB

AMD ZYNQ UltraScale+

4 x 5.6 cm form factor

http://trenz.org/am0010-info
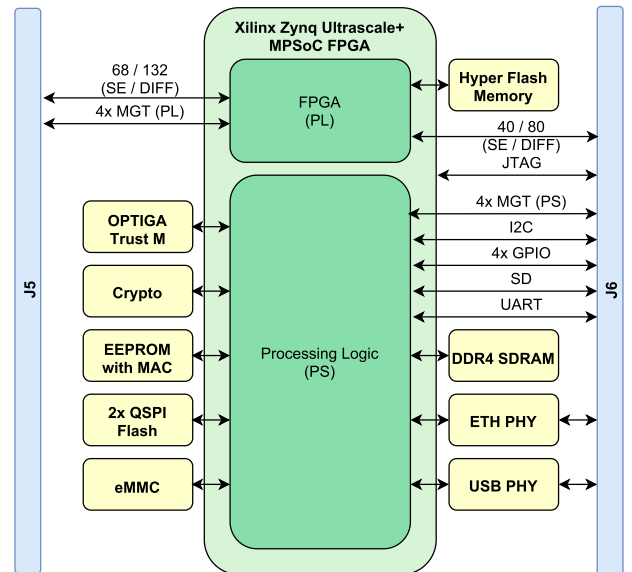
Device list	Connectors	SDRAM max	Flash	e.MMC	Ethernet	USB	Other Features
ZU1CG-ZU5CG, ZU1EG-ZU5EG, ZU4EV, ZU5EV	2 x Samtec ADM6 4 x 60-pin	4 GB DDR4 64-bit (PS) with ECC	2 x 64 MB	8 GB	1 Gbit	USB2.0 OTG	Total I/O: 204, optional HyperRAM, MAC address serial EEPROM with EUI-48 node identity, security controller, Crypto Authentication

TE0820 Series
AMD Zynq™ UltraScale+™, DDR4, Flash, USB, Ethernet, e.MMC

4 x 5 cm form factor

http://trenz.org/te0820-info

Device list	Pin Packages	Connectors	SDRAM max	Flash	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	4 GB DDR4	128 MB	8 - 64 GB	1 Gbit	USB2.0 OTG	132 + 14 MIO	4 x PS GTR	GPU/VCU depending on device, programmable clock generator, single supply

TE0821 Series
AMD Zynq™ UltraScale+™, DDR4, Flash, USB, Ethernet, e.MMC

Pin compatible with TE0820

4 x 5 cm form factor

http://trenz.org/te0821-info

Device list	Pin Packages	Connectors	SDRAM max	Flash	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	4 GB DDR4	128 MB	8 - 64 GB	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

TE0823 Series
AMD Zynq™ UltraScale+™ Low Power FPGA, LPDDR4, Flash, USB, Ethernet, e.MMC

http://trenz.org/te0823-info
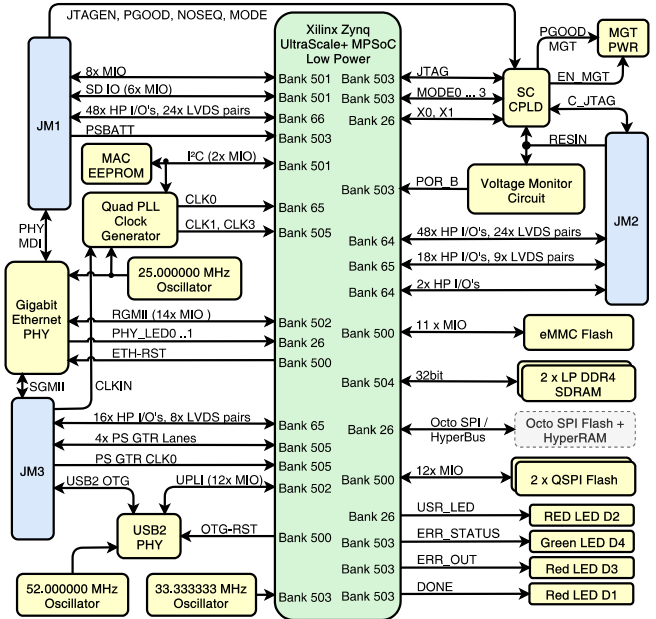
Device list	Pin Packages	Connectors	SDRAM max	Flash	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	784	3 x Samtec LSHM	2 GB LPDDR4	128 MB	8 - 64 GB	1 Gbit	USB2.0 OTG	132 HP + 14 MIO	4 x PS GTR	GPU/VCU depending on device, programmable clock generator, single supply

TE0724 Series
AMD Zynq™ 7000, DDR3L, Flash, Ethernet, EEPROM, CAN

http://trenz.org/te0724-info
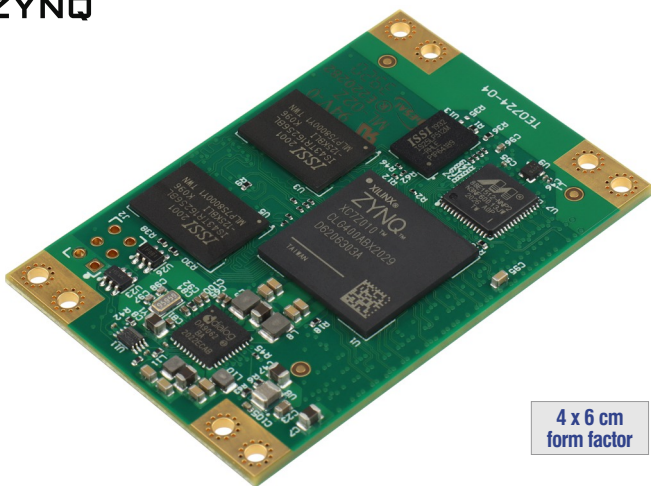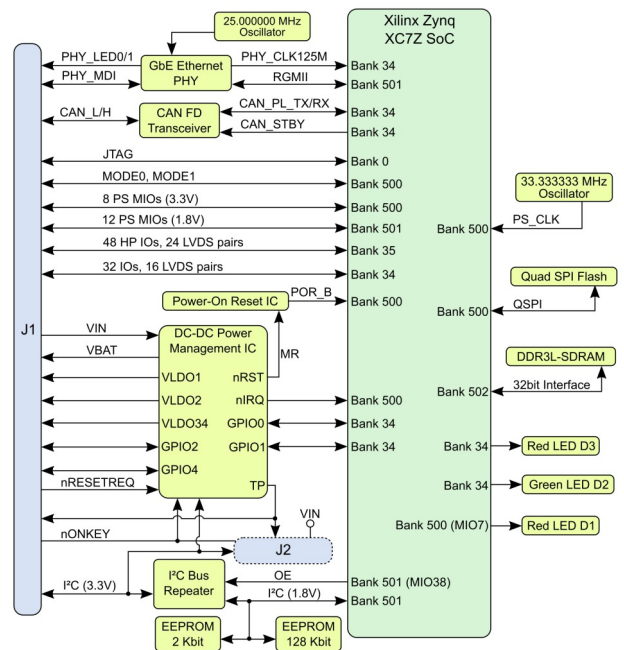
Device list	Connectors	SDRAM max	Flash max	EEPROM	Ethernet PHY	Total I/O	Other Features
Z-7010, Z-7020	1 x Samtec ST5	1 GB DDR3L	64 MB	MAC Address	1 Gbit	PL: 80 PS: 20	CAN, single supply

TE0803/TE0813 "UltraSoM+" Series
AMD Zynq™ UltraScale+™, DDR4, Flash, 8 High Speed Serial Transceivers

AMD ZYNQ UltraScale+

5.2 x 7.6 cm form factor

Compatible with TEBF0808/818

http://trenz.org/te0803-info

Device list	Pin Packages	Connectors	SDRAM max	Flash	Total I/O	Gbit Transceivers	Other Features
ZU2CG - ZU5CG, ZU2EG - ZU5EG, ZU4EV, ZU5EV	C784	4 x Samtec ST5 (TE0803) 4 x Samtec ADM6 (TE0813)	8 GB DDR4	128	204 + 65 MIO	4 x PS GTR 4 x PL GTH (ZU4+ZU5 only)	GPU/VCU depending on device, EEPROM MAC address, programmable clock generator, single supply

TE0807/TE0817 "UltraSoM+" Series
AMD Zynq™ UltraScale+™, DDR4, Flash, 20 High Speed Serial Transceivers
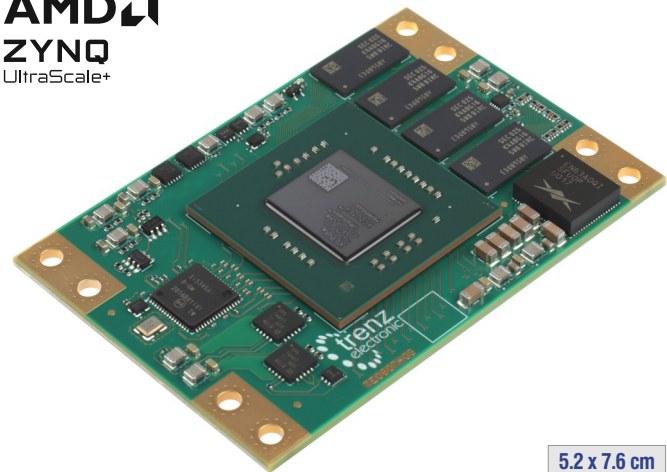
AMD ZYNQ UltraScale+

5.2 x 7.6 cm form factor

Compatible with TEBF0808/818

http://trenz.org/te0807-info
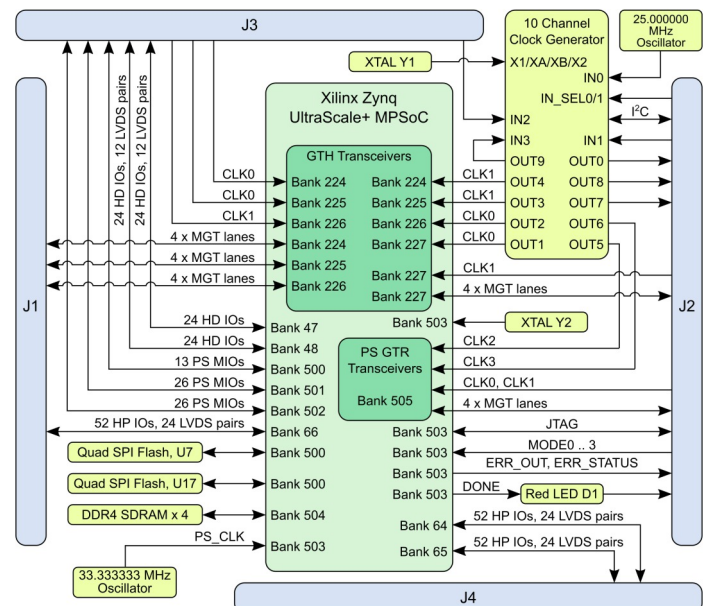
Device list	Pin Package	Connectors	SDRAM max	Flash	Total I/O	Gbit Transceivers	Other Features
ZU4CG - ZU7CG, ZU4EG - ZU7EG, ZU4EV - ZU7EV	B900	4 x Samtec ST5 (TE0807) 4 x Samtec ADM6 (TE0817)	8 GB DDR4	128 MB	204 + 65 MIO	4 x GTR, 16 x GTH	GPU and VCU, programmable clock generator, single supply

TE0808/TE0818 "UltraSoM+" Series
AMD Zynq™ UltraScale+™, DDR4, Flash, 20 High Speed Serial Transceivers

AMD ZYNQ UltraScale+

5.2 x 7.6 cm form factor

Compatible with TEBF0808/818

http://trenz.org/te0808-info
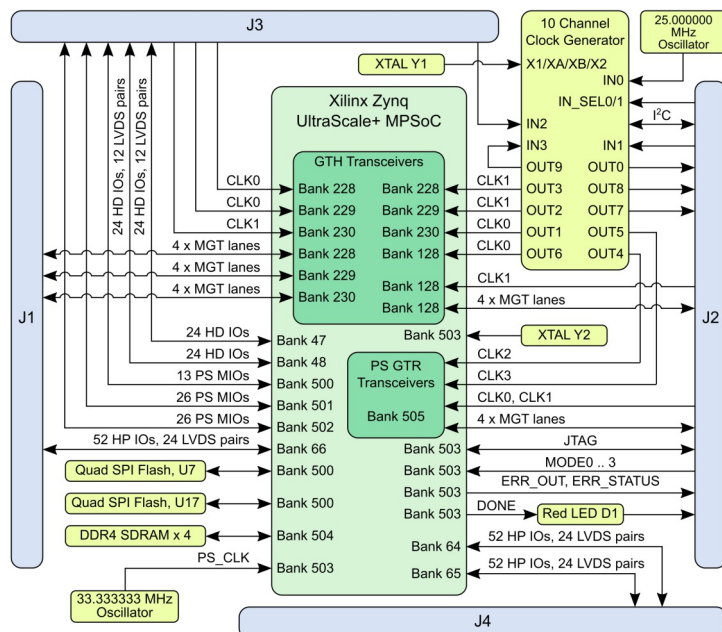
Device list	Pin Package	Connectors	SDRAM max	Flash	Total I/O	Gbit Transceivers	Other Features
ZU6CG, ZU9CG, ZU6EG, ZU9EG, ZU15EG	C900	4 x Samtec ST5 (TE0808) 4 x Samtec ADM6 (TE0818)	8 GB DDR4	128 MB	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply

TE0726 "ZynqBerry" Series
AMD Zynq™7000, DDR3L, Flash, Ethernet, USB, HDMI

AMD ZYNQ

6.35 x 9.3 cm form factor
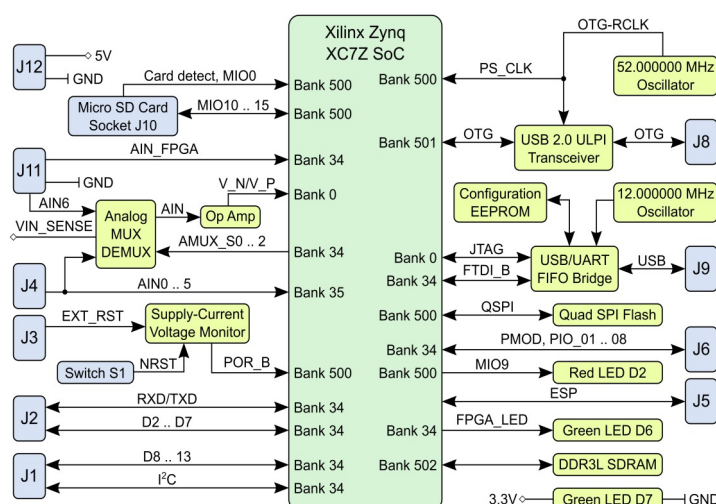
Raspberry Pi 2 compatible

http://trenz.org/te0726-info

Device list	Connectors	SDRAM max	Flash	Ethernet PHY	USB PHY	Total I/O	Other Features
Z-7010, Z-7007S	40-pin "HAT" headers	512 MB DDR3L	16 MB	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

TE0723 "ArduZynq" Series
AMD Zynq™7000, Form Factor like Arduino Shield, DDR3L, Flash, USB OTG
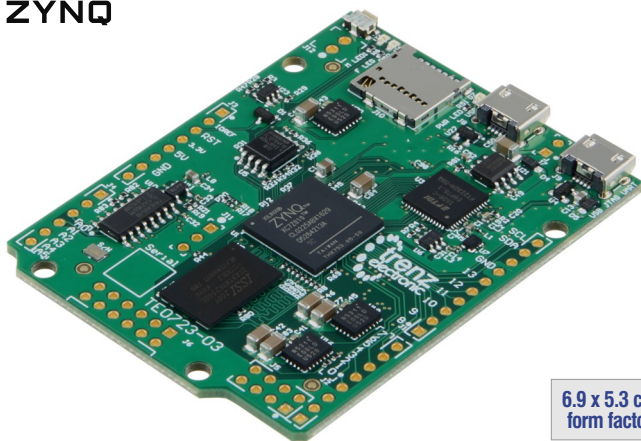
6.9 x 5.3 cm form factor
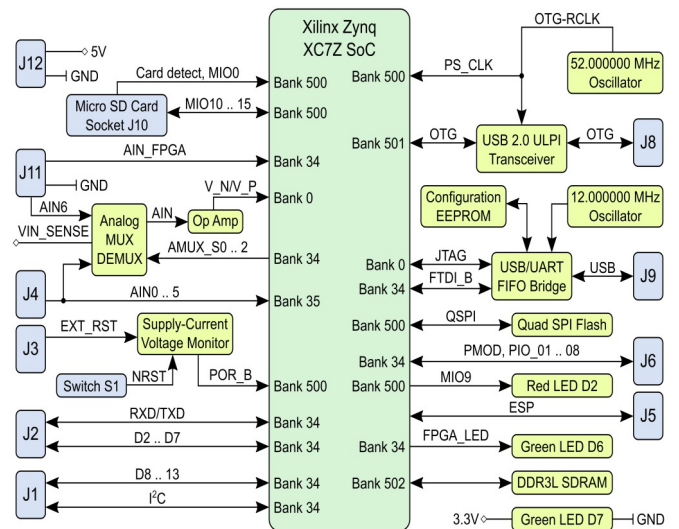
Arduino Shield compatible

http://trenz.org/te0723-info

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

TE0835/TE0836 RFSoC Series
AMD Zynq™ UltraScale+™ RFSoC, DDR4, Flash, Ethernet, USB, EEPROM

6.5 x 9 cm form factor

http://trenz.org/te0835-info
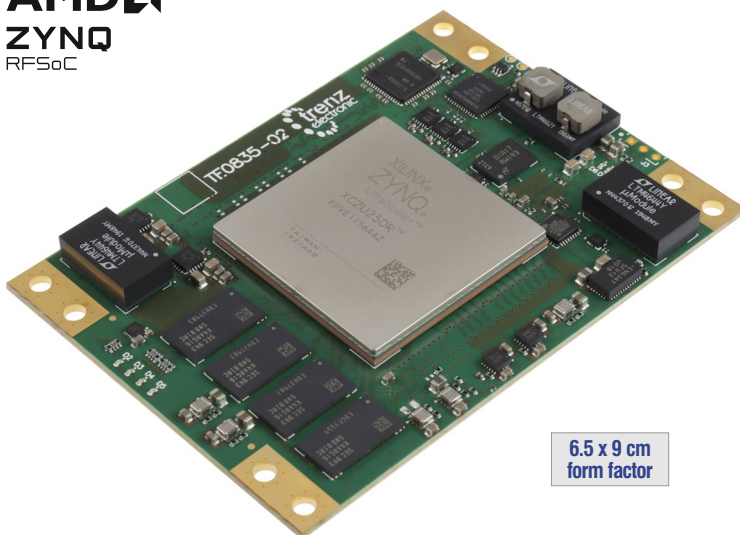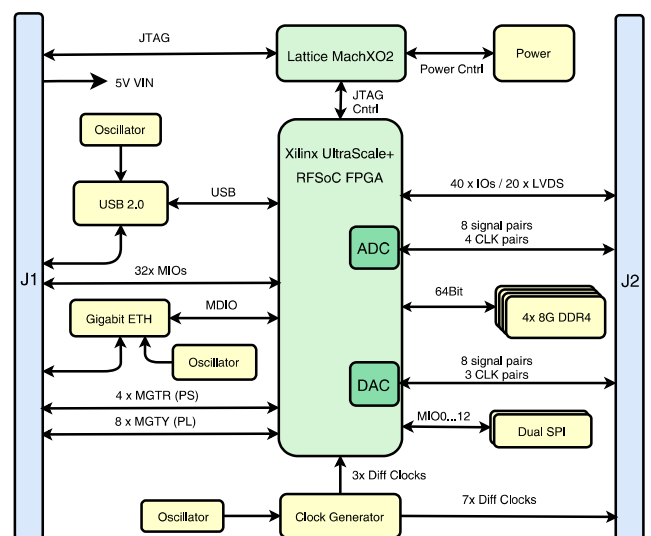
Device list	Pin Packages	Connectors	SDRAM	Flash	Ethernet PHY	Total I/O	Gbit Transceivers	Other Features
ZU25DR, ZU47DR	E1156, speedgrade -1	2 x Samtec ST5 (TE0835) 2 x Samtec ADM6 (TE0836)	4 x 1 GB DDR4	128 MB	1 x Gbit	40 x I/O/ 20 LVDS + 32 MIO	8 x GTY, 4 x GTR	USB2.0 OTG, MAC EEPROM

TEF0008 Series
FMC Card with four SFP+ 10 GBit Ports based on VITA 57.1 FMC HPC Standard

6.9 x 8.4 cm form factor
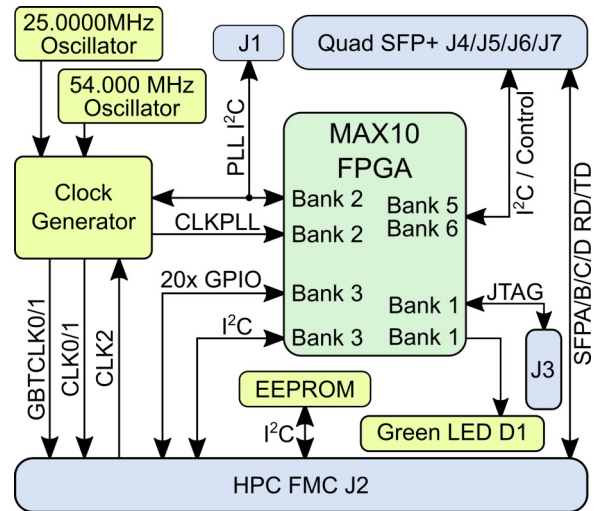
It is intended for use on a FMC HPC carrier and can not be used stand-alone.

http://trenz.org/tef0008-info

Connector	Dimension	SFP+	Other Features
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)

TE0802 MPSoC Development Board
AMD Zynq™ UltraScale+™, LPDDR4, Flash, Ethernet, USB, Audio, Display

10 x 10 cm form factor

http://trenz.org/te0802-info
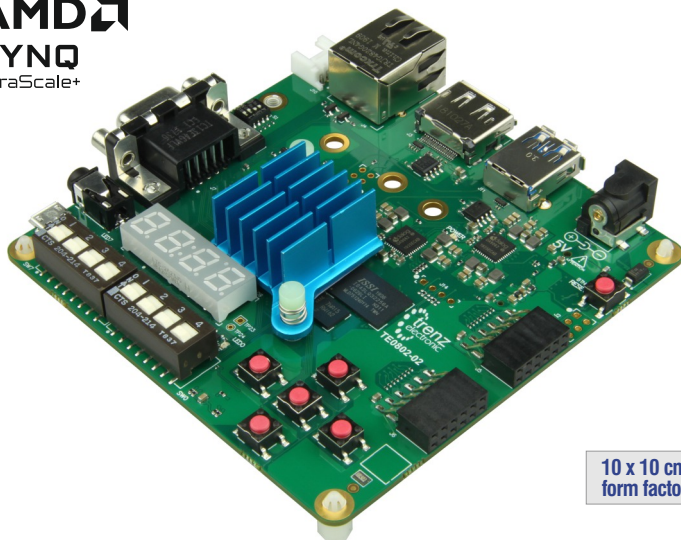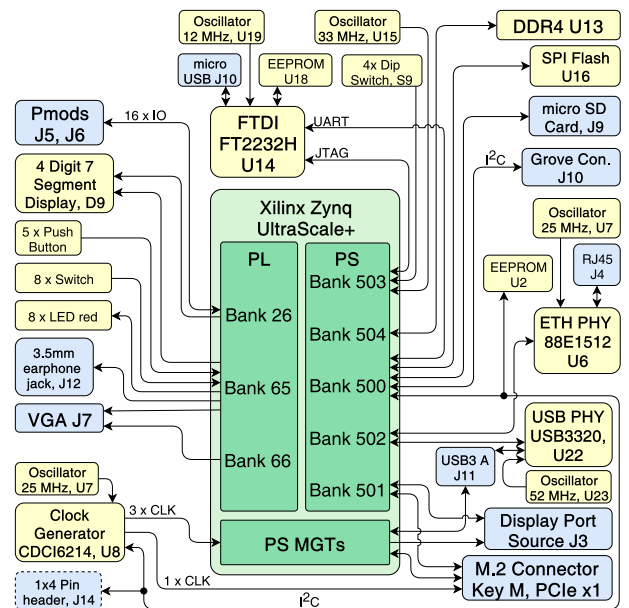
Device list	SDRAM max	Flash	Ethernet RJ45	USB	User I/O	Audio	Other Features
ZU1CG ZU2CG	2 GB LPDDR4	32 MB	1 Gbit	USB3.0 Host (type A connector)	2 Pmod connectors	3.5 mm jack (PWM output)	EEPROM, USB JTAG/UART microUSB, microSD card, M2 PCIe SSD support, display, power: 5V plug

TE0890 "S7 Mini" Series
AMD Spartan™7, Fully Open-Source Module with HyperRAM

AMD SPARTAN7

2.7 x 5.2 cm
form factor

1x20 Pin Header
16 x IO
1x40 Pin Header
32 x IO

Xilinx Spartan
XC7S25 FPGA

SPI FLASH U6
2 x LED red D1, D2

Bank 14

HyperRAM U2

FTDI/UART/4 x IO
1x6 Pin Header

Bank 34

2 x IO
2x3 Jumper Pin Header

Oscillator 100 MHz, U3

JTAG

1x6 Pin Header
32 x IO
LED red D3 (Power)

1x40 Pin Header
16 x IO
1x20 Pin Header

http://trenz.org/te890-info
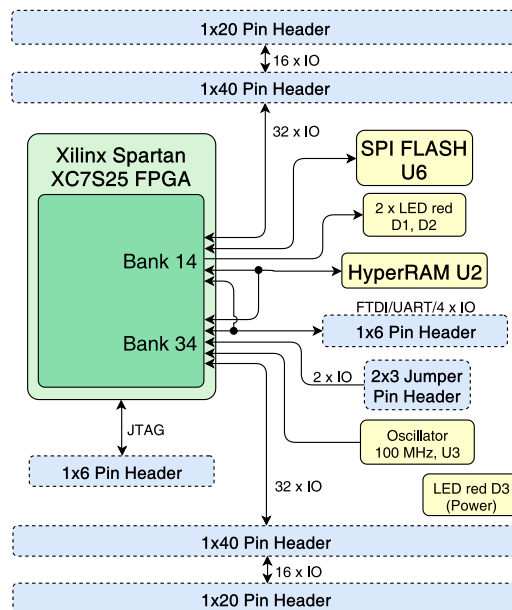
Device list	Footprint compatible	Config PROM	HyperRAM DRAM	Total I/O	Interface(s)	Supply	Other Features
7S25	7S6, 7S15, 7S50 FTGB-196 devices	64 Mb	64 Mb	Dual-Pinout DIP-40 or 50mil 80 pin for 32 or 64 FPGA 3.3V I/Os	Standard 1x6 FTDI cable serial	5V input	23K Logic Cells, 29K Flops, 45 36Kb BRAMs, 80 mults., fully open source

TE0714 Series
AMD Artix™7, Flash, 4 x GTP Transceiver, Form Factor 3 x 4 cm only

AMD ARTIX7

3 x 4 cm
form factor

Xilinx Artix-7 FPGA

48 x IOs, 24 x LVDS pairs — Bank 34
6 x IOs, 3 LVDS pairs — Bank 14
25.000000 MHz Oscillator — CLK25M — Bank 14
JM1
JTAG — Bank 0
ADC — Bank 0
125.0000 MHz Oscillator — MGT_CLK1
MGT_CLK0
4 x MGT lanes

Bank 15 — 48 x IOs, 24 x LVDS pairs
Bank 14 — 2 x IOs
Bank 14 — 34 x IOs, 17 x LVDS pairs
Bank 14 — Quad SPI Flash
Bank 14 — Red LED D4
Bank 0 — BOOTMODE
JM2

GTP Transceivers
Bank 216

http://trenz.org/te0714-info
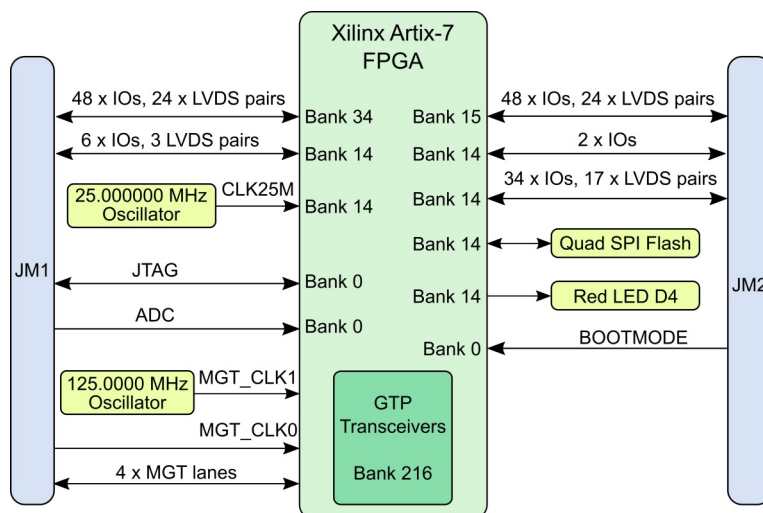
Device list	Pin Packages	Connectors	Flash	Total I/O	Gbit Transceivers	Config. Voltage (B14)	Other Features
15T, 35T, 50T	CSG325	2 x Samtec LSHM	16 MB	138 + 5 (QSPI or user I/Os)	4 x GTP	3.3V or 1.8V	Differential MEMS oscillator for MGT clocking, XADC analog Input, eFUSE bit-stream encryption (AES), single supply

TE0727 "ZynqBerryZero" Series
AMD Zynq™7000, Raspberry Pi Zero Form Factor, DDR3L, Flash, USB, mini HDMI

AMD ZYNQ

3 x 6.5 cm form factor

http://trenz.org/te0727-info
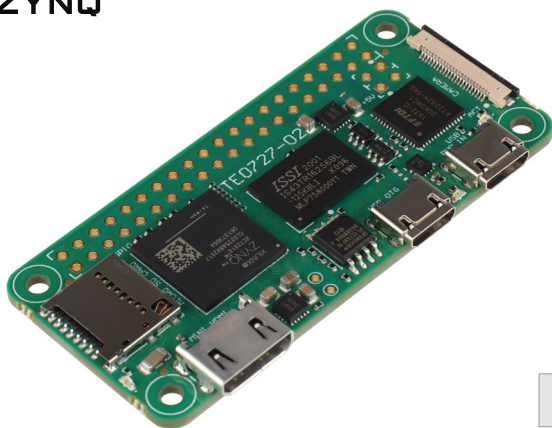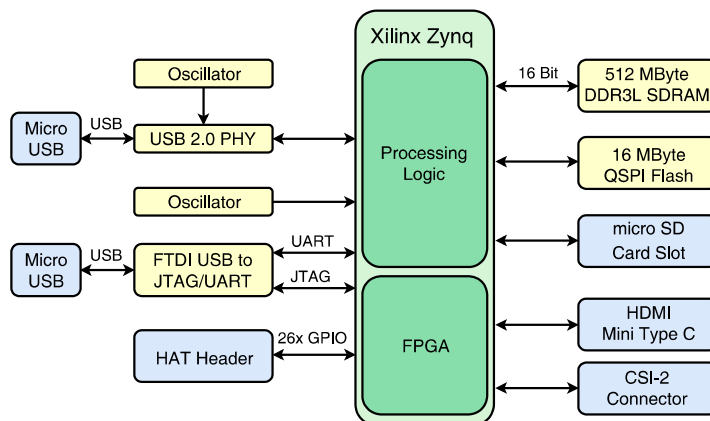
Device list	SDRAM max	Flash	HAT header	Total I/O	Other Features
Z-7010	512 MB DDR3L	16 MB	40-pin	26 GPIO	2 x micro USB2.0, microSD card slot, Mini HDMI type C, CSI-2 connector (camera)

TE0725 Series
AMD Artix™7, Flash, HyperRAM, 2 x 50-pin Headers, 2.54 mm Pitch

AMD ARTIX 7
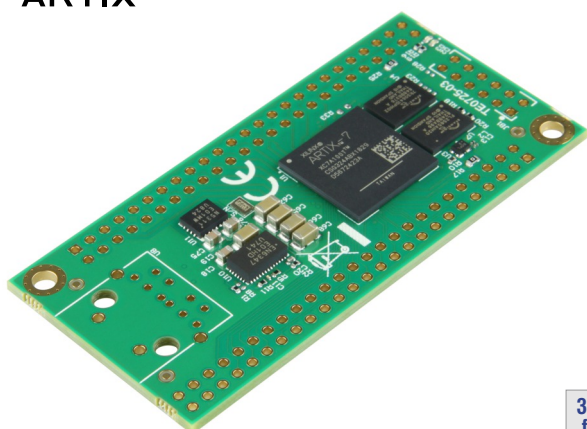
3.5 x 7.3 cm form factor
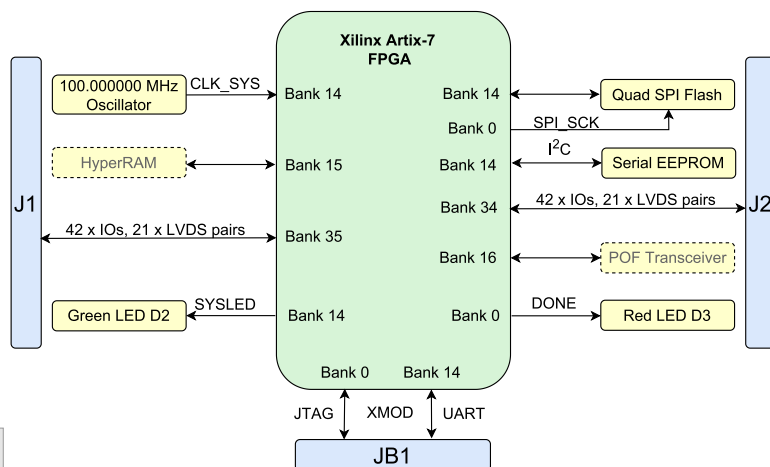
The TE0725LP series is the same form factor, but w/o POF adapter and depending on variant 3.3 or 1.8V main power VIN, 4 diff. pairs in extra header J3, system clock 25 MHz (can be customized on request).

http://trenz.org/te0725-info

Device list	Pin Packages	Connectors	HyperRAM max	Flash	EEPROM	Total I/O	Other Features
15T, 35T, 50T, 75T, 100T	CSG324	2 x 50-pin headers	8 MB	32 MB	16 KB	87	Optional POF (Plastic Optical Fiber) adapter (125/250 Mbit/s), single supply

TE0716 Series
AMD Zynq™ 7000, DDR3L, Flash, Ethernet, USB PHY, low power SAR ADCs
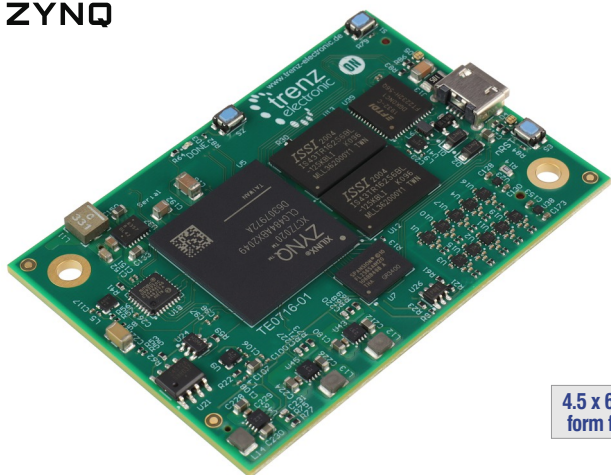
4.5 x 6.5 cm
form factor
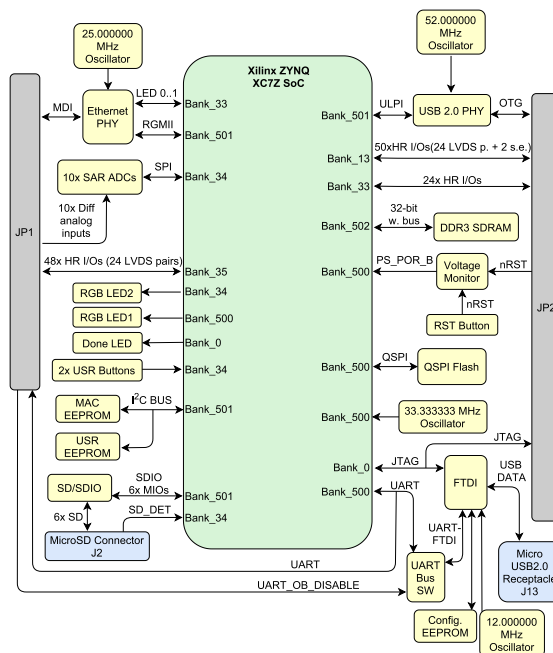
http://trenz.org/te0716-info

Device list	Connectors	SDRAM max	Flash	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
Z-7020	2 x FCI Bergstak	1 GB DDR3L	32 MB	1 Gbit	USB2.0	120 x HR PL	2 x PS MIOs	On board 10x 12-bit low power SAR ADCs up to 2 MSPS, low power oscillators, USB2.0 to UART/JTAG interface, EEPROM

TE0728 Series
AMD Zynq™ 7000, DDR3, Flash, Ethernet, CAN, Automotive
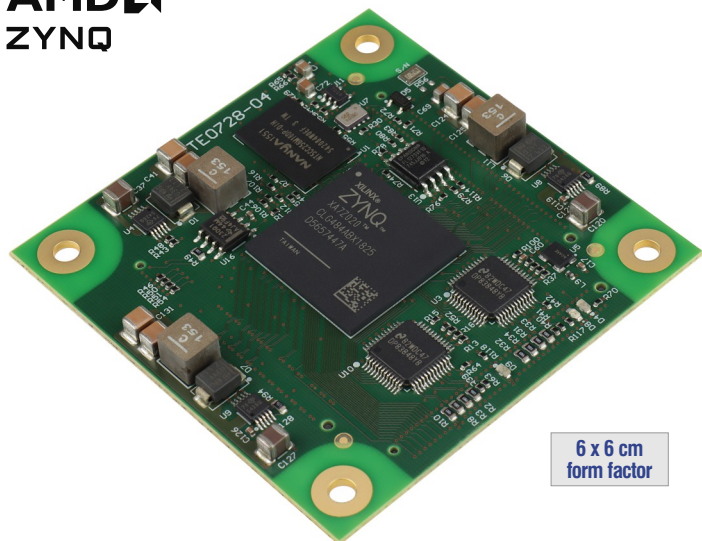
6 x 6 cm
form factor

http://trenz.org/te0728-info
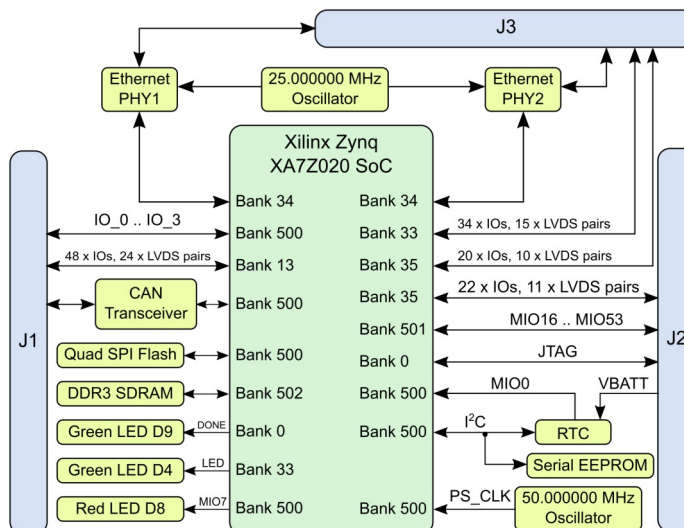
Device list	Connectors	SDRAM max	Flash	EEPROM	Ethernet PHY	Total I/O	Other Features
XA7Z020 (automotive FPGA)	3 x Samtec SEM	512 MB DDR3	16 MB	8 KByte	2 x 100 Mbit	124 + 30 MIO	Automotive, real time clock, CAN, single supply

TE0729 Series
AMD Zynq™7000, DDR3, Flash, Ethernet, EEPROM, USB, e.MMC

http://trenz.org/te0729-info
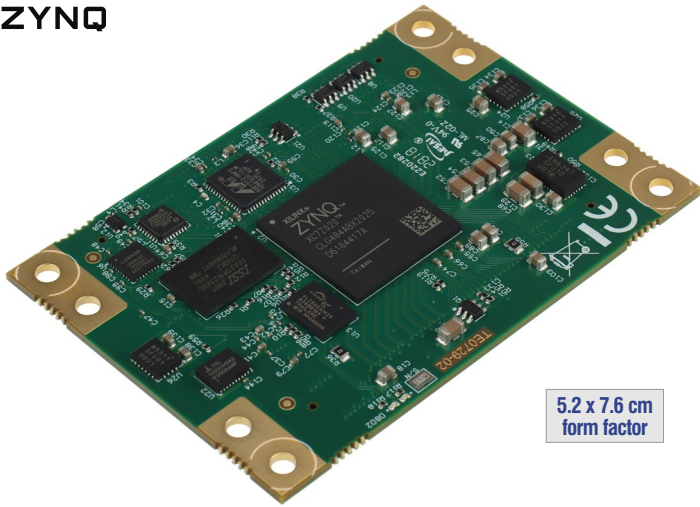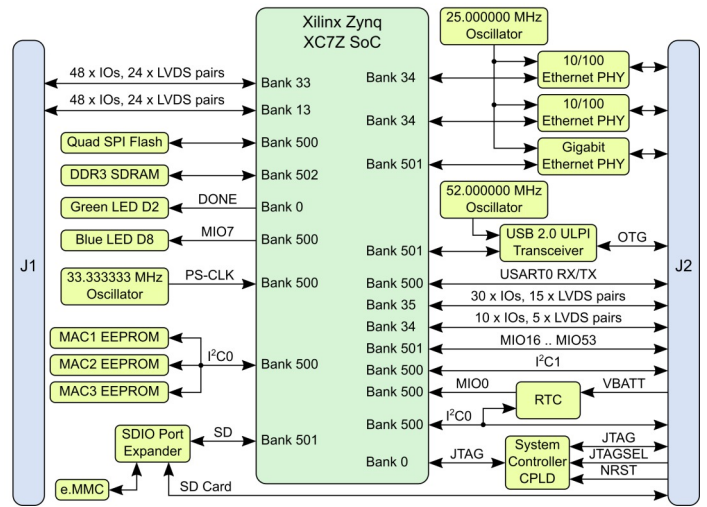
Device list	Connectors	SDRAM max	Flash	e.MMC	Ethernet PHY	USB PHY	EEPROM	Total I/O	Other Features
Z-7020	3 x Samtec LSHM	512 MB DDR3	32 MB	4 - 64 GB	2 x 100 Mbit, 1 Gbit	USB2.0 OTG	3 x MAC address	136 + 14 MIO	Real time clock, single supply

---

TE0745 Series
AMD Zynq™7000, DDR3L, Flash, USB, Ethernet, 8 x GTX

5.2 x 7.6 cm form factor
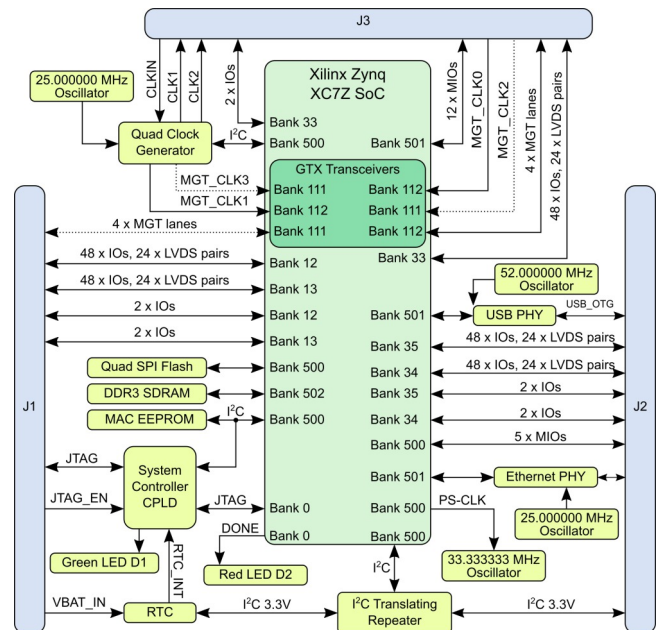
http://trenz.org/te0745-info

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

TE0782 Series
AMD Zynq™7000, DDR3, Flash, 2 x GBit Ethernet, 2 x USB, e.MMC, 16 x Transceivers

8.5 x 8.5 cm form factor
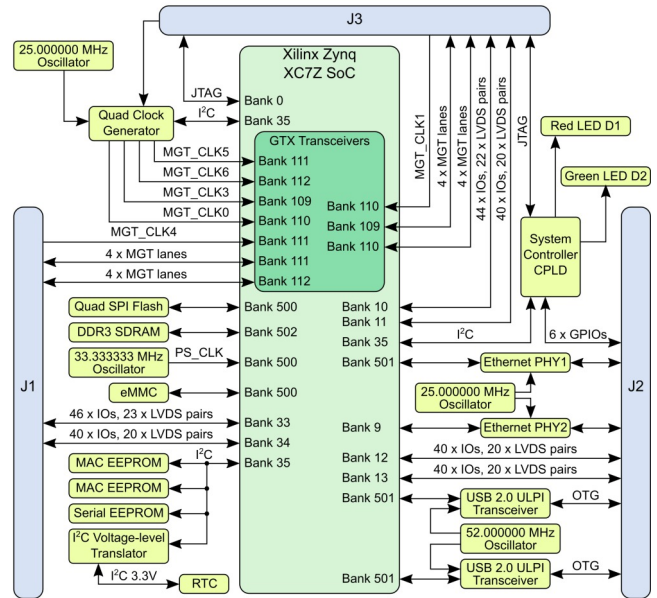
http://trenz.org/te0782-info

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

TE0783 Series
AMD Zynq™7000, Memory on both PS and PL, Flash, Ethernet, USB, e.MMC

8.5 x 8.5 cm form factor

http://trenz.org/te0783-info
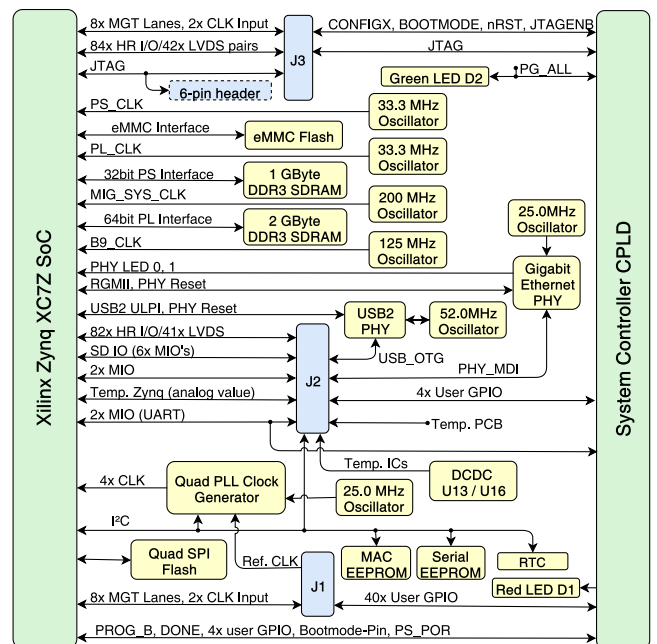
Device list	Connectors	SDRAM max	Flash	e.MMC	Ethernet PHY	Total I/O	Gbit Transceivers	Other Features
Z-7035, Z-7045, Z-7100	3 x Samtec QTH	1 GB DDR3 32-bit (PS) 2 GB DDR3 64-bit (PL)	32 MB	4 - 64 GB	1 Gbit	166	16 x GTX 4 x GT	USB2.0 OTG, programmable clock generator, real time clock, single supply
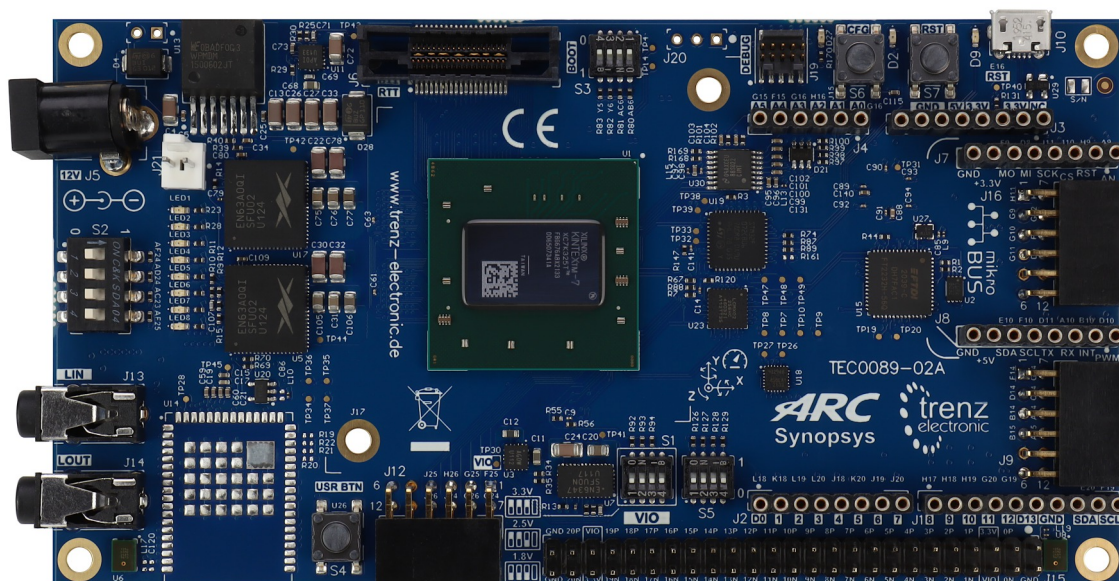
The DesignWare® ARC® EM Software Development Platform is a flexible platform for rapid software development on ARC EM processors and subsystems. It is intended to accelerate software development and debug of ARC EM processor-based systems for a wide range of ultra-low power embedded applications such 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 16 MB of PSRAM, 16 MB of SPI Flash and a wide range of peripherals such Audio Line In/Out, UART, SPI, I2C, and ADC. A 9-D motion sensor enable fast development of IoT applications. Two digital MEMs micro-phones 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

- AMD Kintex™ 7 XC7K325T-2FBG676C
- 32 MByte Quad-SPI Flash memory (for configuration and operation)
- USB-JTAG bridge FT2232H
- 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 2 mm

- 2 x 8 MByte PSRAM
- 32 MByte User Quad-SPI Flash memory
- Micro SDcard Socket
- 3-axis gyroscope, 3-axis accelerometer, 3-axis magnetometer
- Stereo audio codec MAX9880A
- 2 x PDM microphones
- 2 x 3.5mm RCA audio jacks (input/output)
- 100 MHz user clock oscillator SiT8008
- Status LEDs, power LED
- 12V sower supply (separately included in the scope of delivery)
- Dimensions: 72,5 x 137 mm
- Article number: TEC0089-02-D2C-1-D

Available at http://trenz.org/tec0089

TEC0330 PCIe FMC Carrier
AMD Virtex™7, FMC HPC, 8 lane PCIe GEN2 card, DDR3 SODIMM Socket

10.66 x 16.76 cm form factor

http://trenz.org/tec0330-info
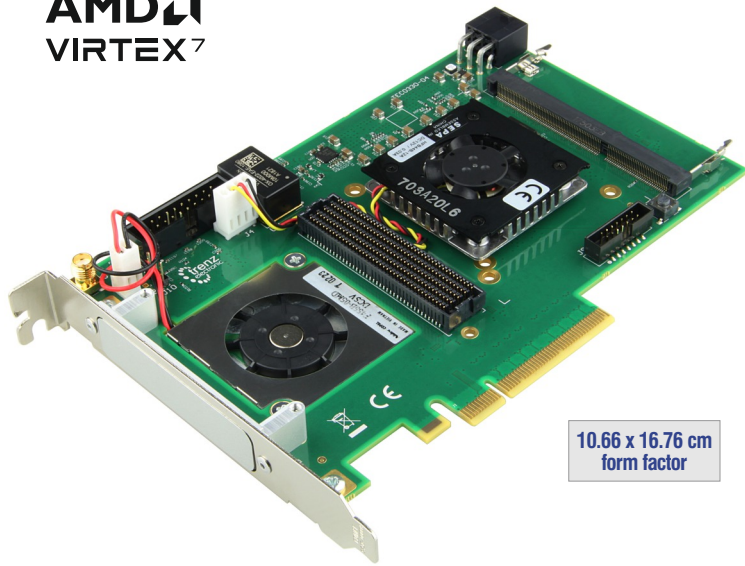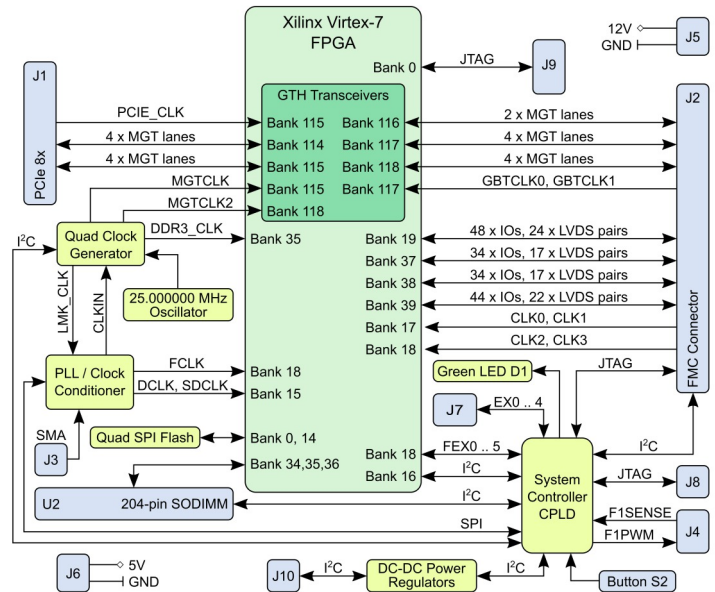
Device list	SDRAM	Flash	Total I/O	Gbit Transceivers	Gbit Transceivers Transmission Rate	Other Features
XC7VX330T	DDR3 SODIMM Socket	32 MB	Up to 202 FPGA I/O pins on FMC connector	10 on FMC 8 on PCIe lanes	13.1 Gbit/s	FMC High Pin Count (HPC) connector, programmable clock generator

TEF1001 PCIe FMC Carrier
AMD Kintex™7, FMC HPC, 4 lane PCIe GEN2 card, DDR3 SO-DIMM Socket
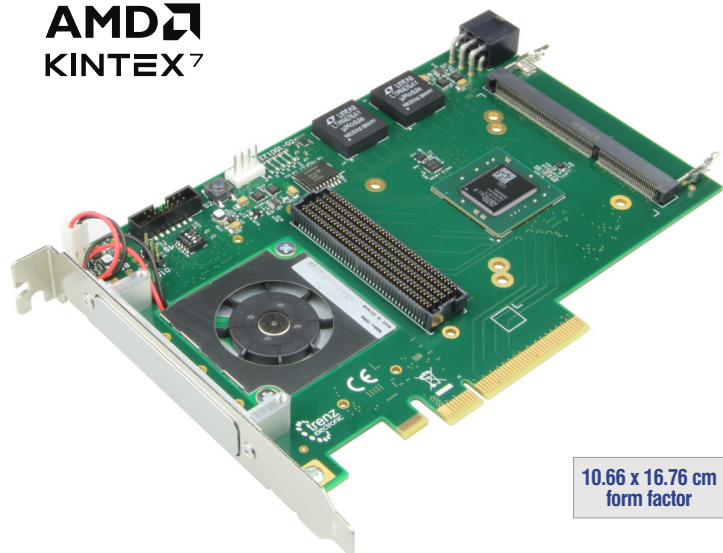
10.66 x 16.76 cm form factor

http://trenz.org/tef1001-info
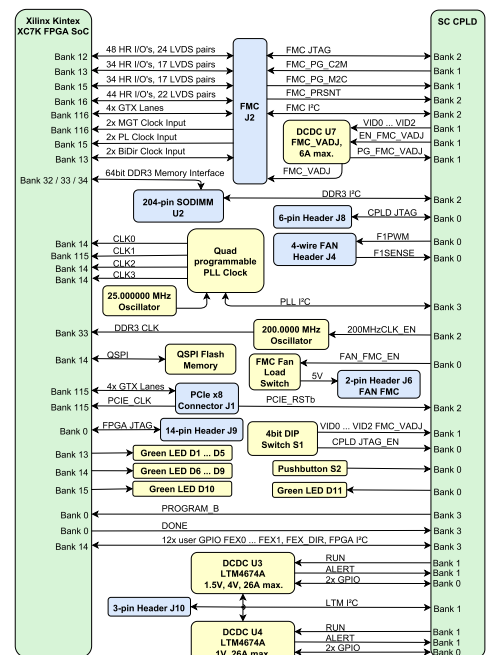
Device list	SDRAM	Flash	Total I/O	Gbit Transceivers	Other Features
XC7K160T	8 GB DDR3 (max) SODIMM Socket	32 MB	160 on FMC connector	4 on FMC 4 on PCIe lanes	Vita 57.1 FMC HPC slot, programmable clock generator, 200 MHz low jitter LVDS oscillator

TEF1002 PCIe FMC Carrier
PCIe Carrier for Trenz Electronic 4 x 5 Modules and LPC FMC

10.66 x 16.76 cm form factor

http://trenz.org/tef1002-info
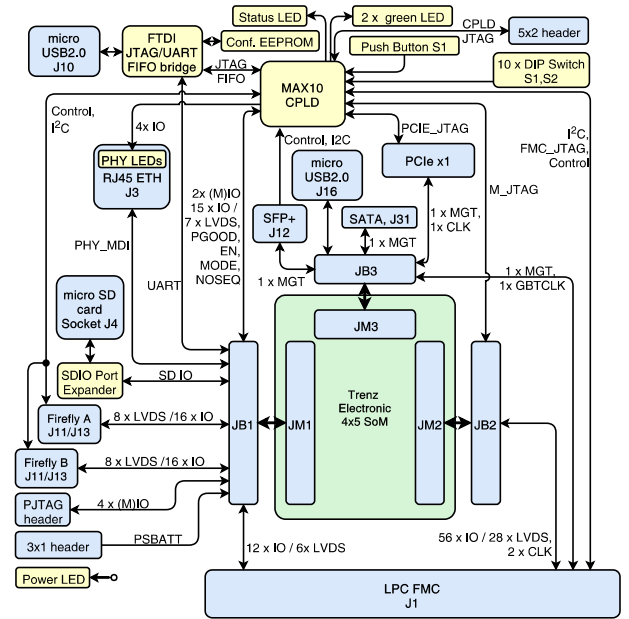
PCIe Carrier	Connectors	Other Features
For 4 x 5 cm modules	LPC FMC, SFP+, PCIe x1, SATA with pin 7 power configuration for SATADoM, RJ45 Gigabit Ethernet, micro USB to JTAG/UART bridge, 2 x 8 LVDS (FireFly), microUSB, microSD card	MAX 10 CPLD, 4 x LED, module reset button, 10 x configuration/user dip switch

TEI0022 DataStorm DAQ
M-Board FMC Carrier for M-Series Precision Converters

13 x 16 cm form factor

http://trenz.org/tei0022-info
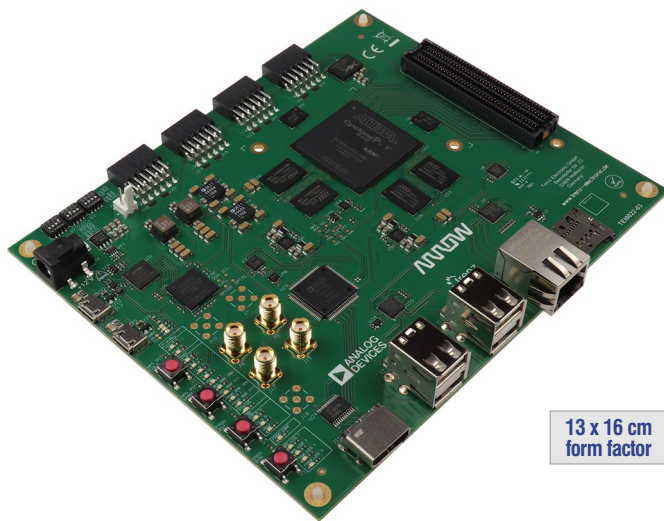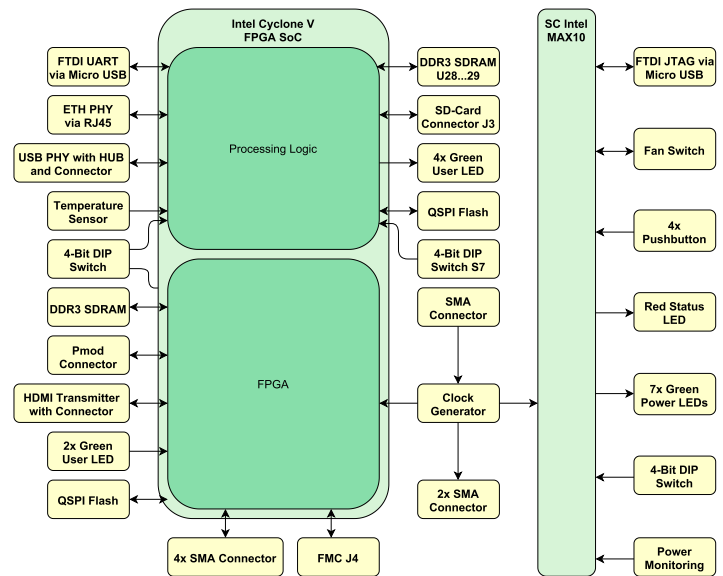
Device list	SDRAM max	Flash	On Board	Interface	Other Features
Cyclone® V 5CSEMA5F31C8N	1 GB for HPS 1 GB for FPGA	32 MB SPI for HPS 32 MB SPI for FPGA	up to 7 x SMA connector, temperature sensor, Intel® MAX® 10 for board management	Connectors: LPC FMC, 4 x Pmod, JTAG, UART via microUSB B (for FPGA and HPS), 4 x USB2.0 host, Ethernet, SD card, HDMI	Power: 12V input supply voltage

TEB0911 UltraRack+ Board
AMD Zynq™ UltraScale+™, 6 FMC Slots, Gigabit Ethernet
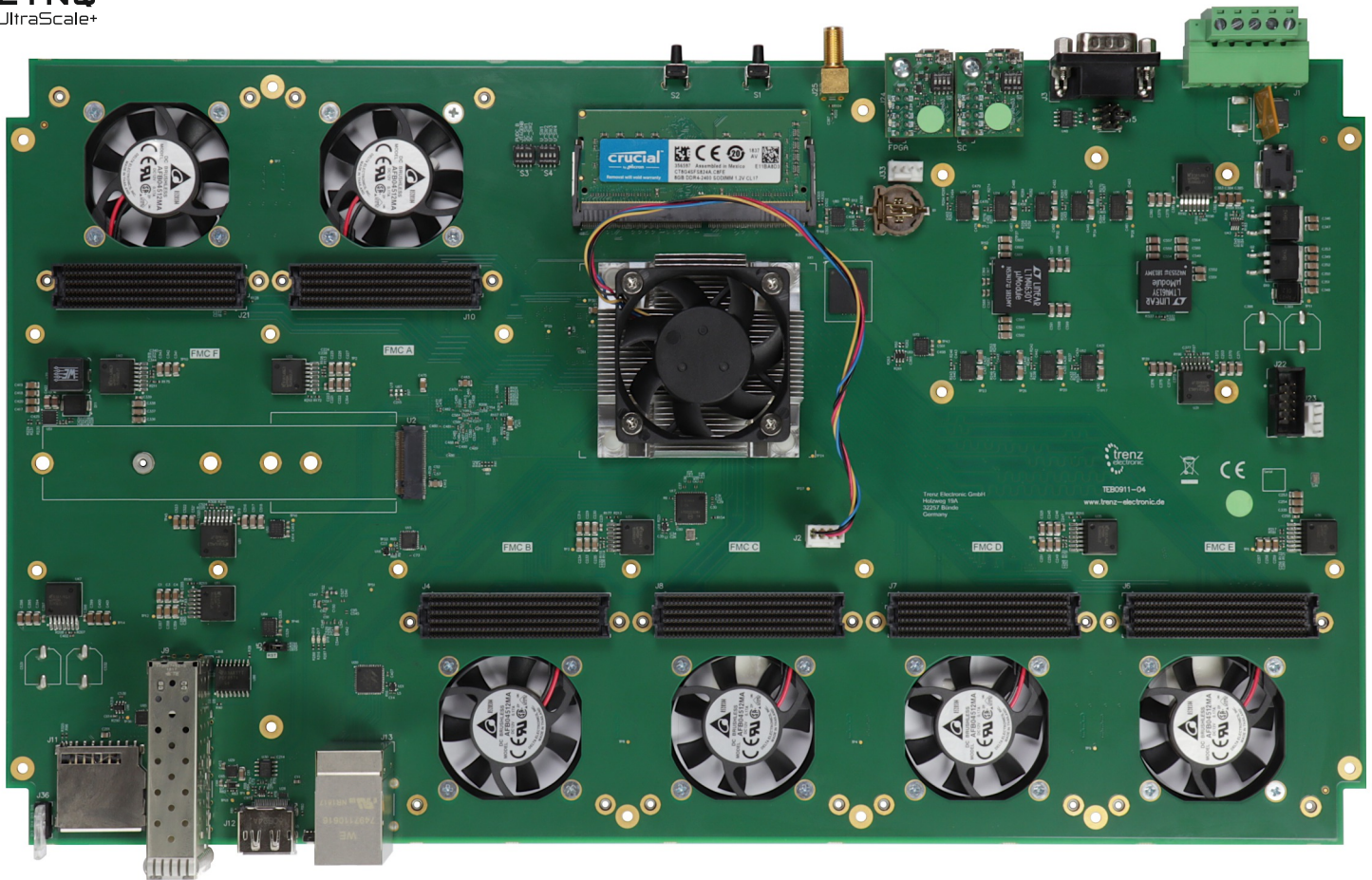
Key Features

The TEB0911 UltraRack+ board is integrating a AMD Zynq™ UltraScale+™ MPSoC with 2 x 64 MByte 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 an 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.

- AMD Zynq™ UltraScale+™ MPSoC
  - 1156 Pin Package
  - Assembly options: ZU6, ZU9, ZU15
- 64-bit DDR4 SODIMM (PS connected)
- M2 PCIe SSD (1-Lane)
- e.MMC (bootable)
- 2 x 64 MByte Dual QSPI Flash (bootable)
- System controller (LCMXO2-7000HC)
  - 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
- 40.6 x 23.43 cm board size
- Other assembly options for cost or performance optimization plus high volume prices available on request.

http://trenz.org/teb0911-info

TEI0006 Series
Intel® Cyclone® 10 GX SoM, DDR3, Flash, Ethernet, MAX 10 as power sequencer

intel.

6 x 8 cm form factor

http://trenz.org/tei0006-info
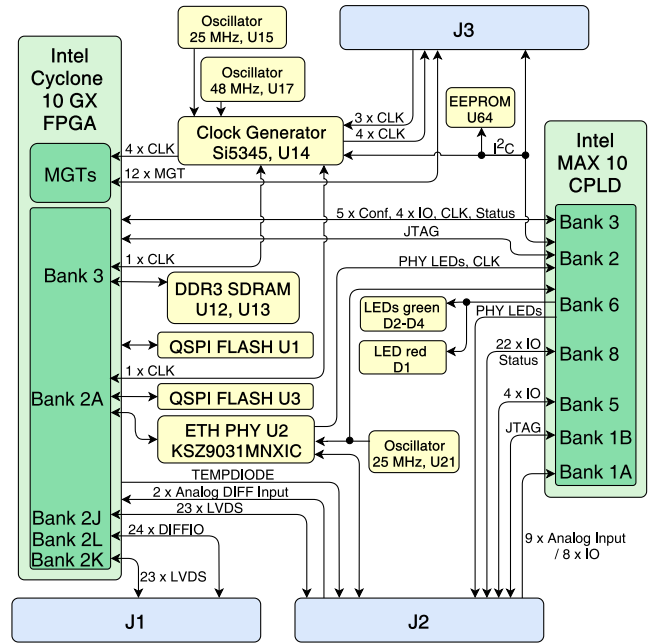
Device list	Connectors	SDRAM	Flash	Ethernet	Other Features
10CX220, 10CX150, 10CX105	3 x Samtec ST5	2 GB DDR3	256 MB	1 Gbit	Intel® MAX® 10 as power sequencer, EEPROM, 4 LEDs, 5V input voltage

---

TEIB0006
Development Carrier Board for Trenz Electronic's TEI0006 FPGA Module

12 x 15 cm form factor

http://trenz.org/teib0006-info

Key Features

RAM/Storage
• EEPROM

On Board
• 3 x LEDs (power, 2 x user)
• 3 x I/O expanders
• 3 x push buttons (2 x user, system controller config)
• DIP switch

Interface
• 2 x SFP connectors
• 3 x Samtec ST5 B2B connectors
• FMC HPC connector (10 x transceiver, 34 x LVDS on LA, 10 x LVDS on HA), VADJ=1.8V
• Gigabit Ethernet connector
• USB2.0 - microUSB (JTAG/UART)
• USB3.0 - type C

Power
• 12V input voltage

TEI0001 "MAX1000" and TEI0003 "CYC1000" Series
Arduino MKR Standard 2.5 x 6.15 cm

intel.

Resources http://trenz.org/tei0001-info

Resources http://trenz.org/tei0003-info
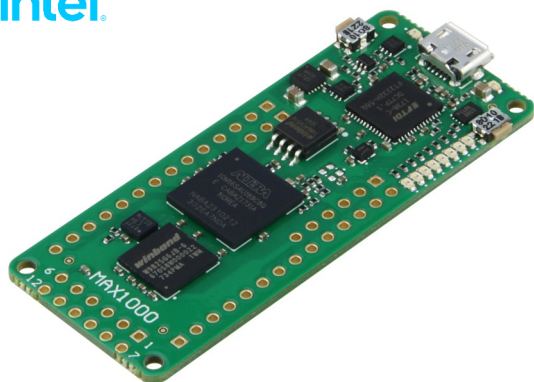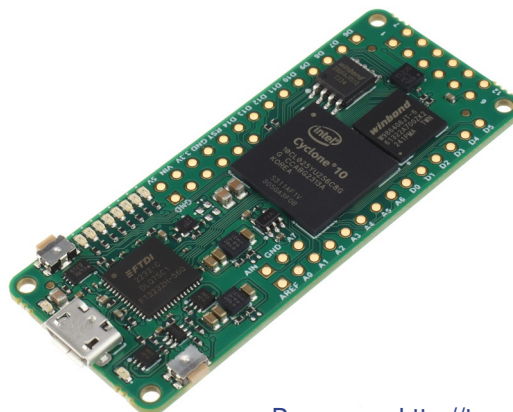
TEI0001 series "MAX®1000" IoT Maker board

- 10M02, 10M04, 10M08, 10M16
- 8 or 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
- 5V power supplied from the USB port or via a pin

TEI0003 series "CYC1000" with Intel® Cyclone®

- 10CL006, 10CL010, 10CL016, 10CL025
- 25 kLE
- 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

TEI0009 C10LP RefKit Development Board
Intel® Cyclone® 10 LP, Integrated USB Programmer2, 2 x 10/100 Ethernet, USB2.0

intel.

9.5 x 11 cm
form factor

http://trenz.org/tei0009-info
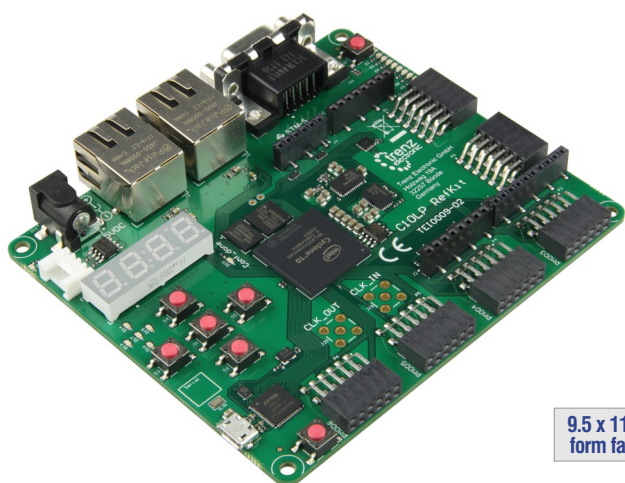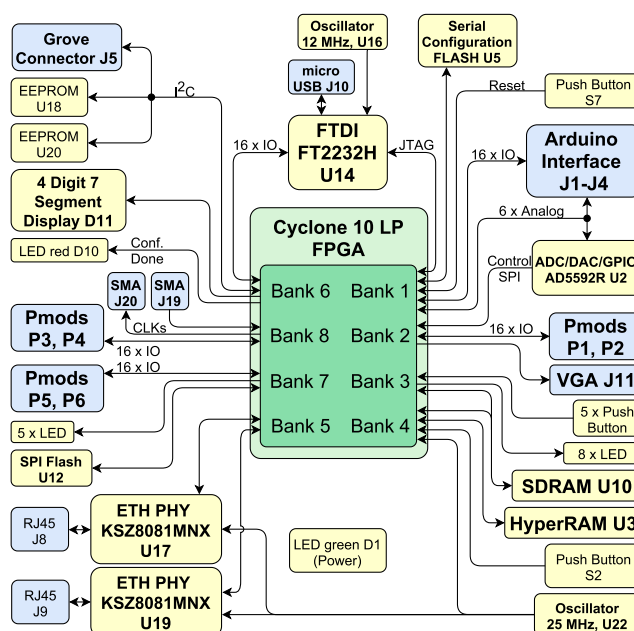
Device list	Connectors	SDRAM max	User Flash QSPI	HyperRAM max	Flash max	Ethernet PHY	USB	Other Features
10CL055	QSE (for LVDS), Pmod, Arduino, SMA	512 Mbit	Up to 512 Mbit	128 Mbit	32 Mbit	2 x 10/100	USB2.0	Integrated USB programmer2

TEL0001 "LXO2000" Series
Lattice XO2 FPGA, Arduino MKR Standard, on-board USB/JTAG and USB/serial

2.5 x 6.15 cm form factor

http://trenz.org/tel0001-info
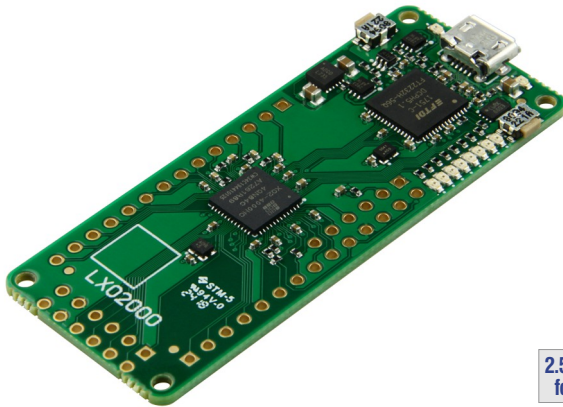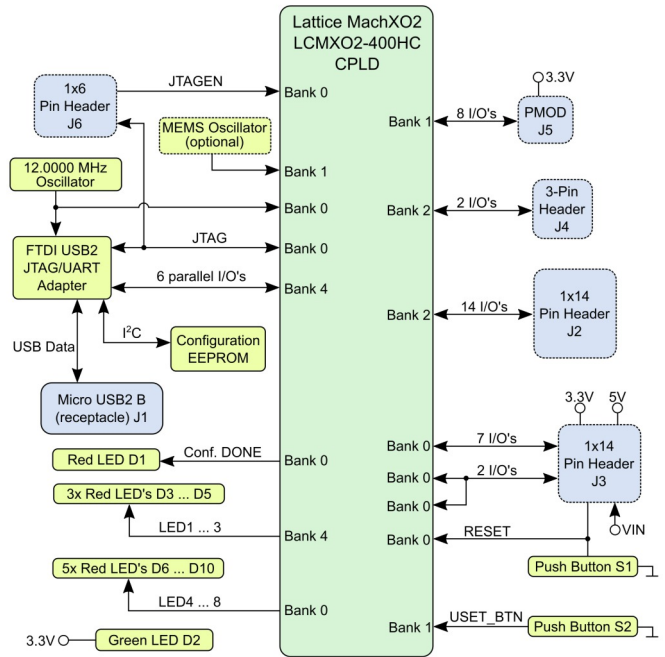
Device list	On-Board	Total I/O	Clock Oscillator	Other Features
LCMXO2-4000HC	USB/JTAG, USB/serial	22 on MKR header, 2 I/O on additional header, optional Pmod header +8	100 MHz MEMS	8 LEDs, 2 push buttons, supply: USB or 5V from pin header, RC-networks

TE0876 IceZero Series
Lattice ICE40HX, Raspberry Pi HAT compatible, SRAM, Flash, Open-Source

5.6 x 3.05 cm form factor

http://trenz.org/te0876-info
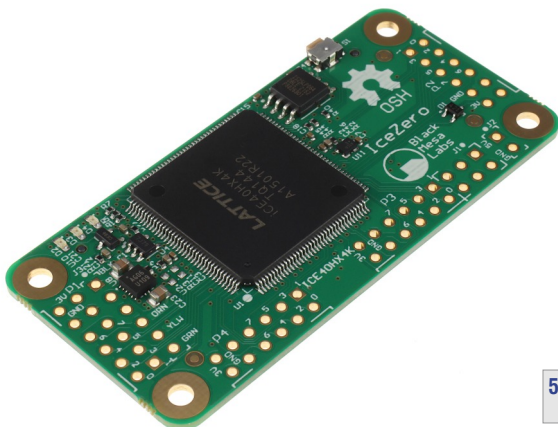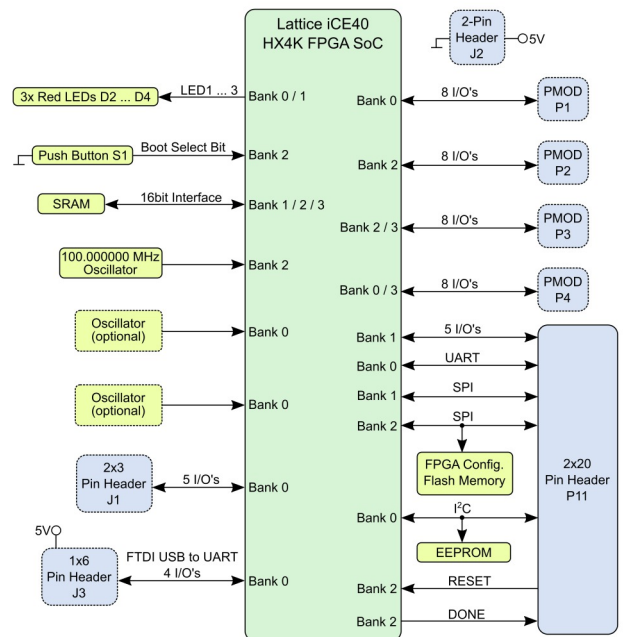
Device list	Connectors	SDRAM max	Flash	Other Features
iCE40HX	4 2x6-pin Pmod connectors (no default)	4 Mbit external SRAM	8 MB	100 MHz user clock, 3 user LED, supported by fully open source FPGA toolchain, fast FPGA configuration from Raspberry Pi, full FPGA design flow on Raspberry Pi (all open source)

TEM0001 "SMF2000" Series
Microchip SmartFusion® 2, Arduino MKR Standard, SDRAM, Flash, UART/JTAG

trenz electronic GmbH

http://trenz.org/smf2000-info
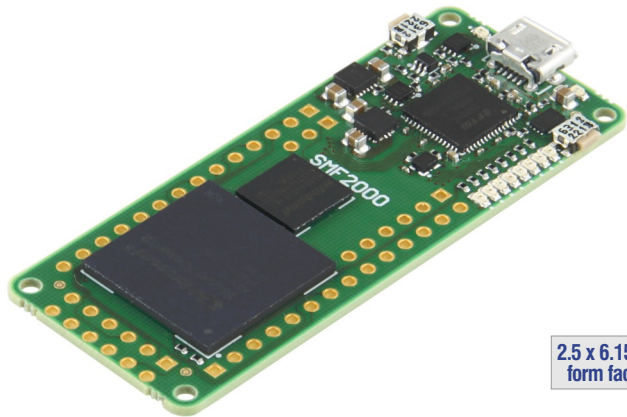
2.5 x 6.15 cm form factor
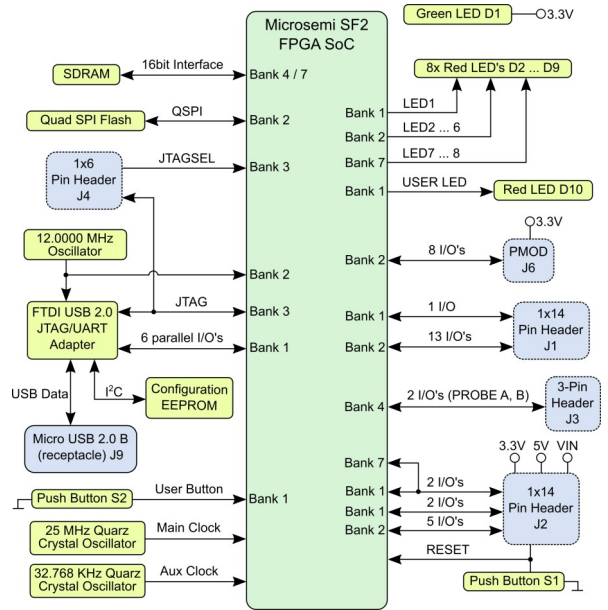
Device list	SDRAM	Flash	Clocks	JTAG/UART	Total I/O	Other Features
M2S005, M2S010, M2S025, M2S050, M2S060	8 MB	8 MB	25 MHz system clock 32.768 kHz auxiliary clock	microUSB2.0 connector	31 (8 I/O 1 x Pmod header, 23 I/O 2 x 14-pin header)	1 x 3-pin headerfor LiveProbes, 9 user LEDs, 1 user push button

TEM0005 Series
Microchip SmartFusion® 2 SoC, DDR3, Flash, Ethernet, EEPROM
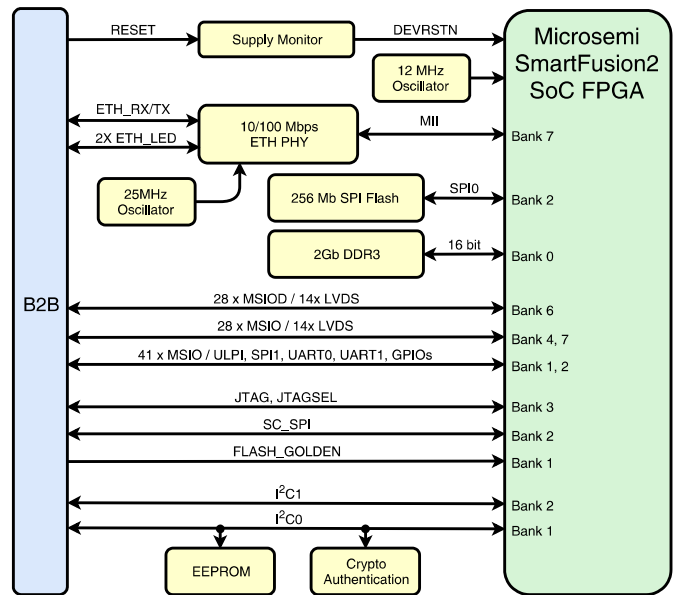
trenz electronic GmbH

http://trenz.org/tem0005-info

3.1 x 5.6 cm form factor

Device list	Connectors	SDRAM max	Flash	Ethernet PHY	Total I/O	Other Features
M2S005, M2S010, M2S025, M2S050, M2S060	1 x Samtec ST5 160 pin	8 Gb DDR3, optional DDR3L	32 MB	100 Mbps	105	Optional crypto authentication device, serial EEPROM for MAC address, power supply monitor

TEM0007 Series
Microchip PolarFire® Multi-Core RISC-V SoC FPGA, LPDDR4, Flash, Ethernet, EEPROM
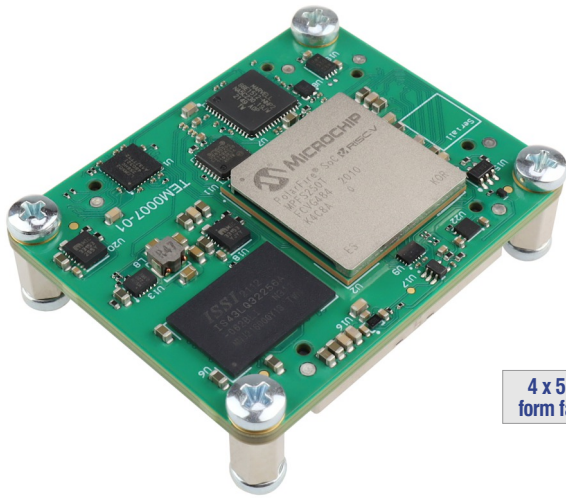
4 x 5 cm form factor
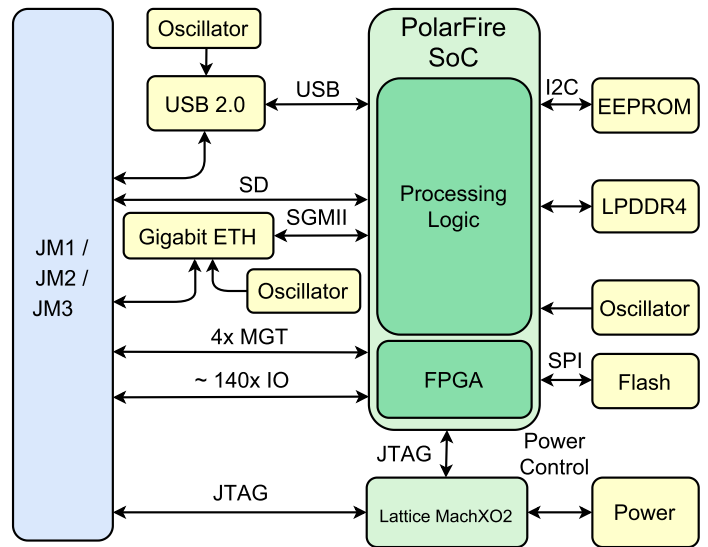
http://trenz.org/tem0007-info

Device list	Pin Package	Connectors	SDRAM max	Flash	Ethernet	Other Features
MPFS025T, MPFS095T, MPFS160T, MPFS250T	FCVG484I	3 x Samtec LSHM	1 GB LPDDR4	64 MB	1 Gbit	EEPROM MAC address, USB2.0

TEM0008 Series
Microchip PolarFire® Multi-Core RISC-V SoC FPGA, LPDDR4, Flash, Ethernet, USB
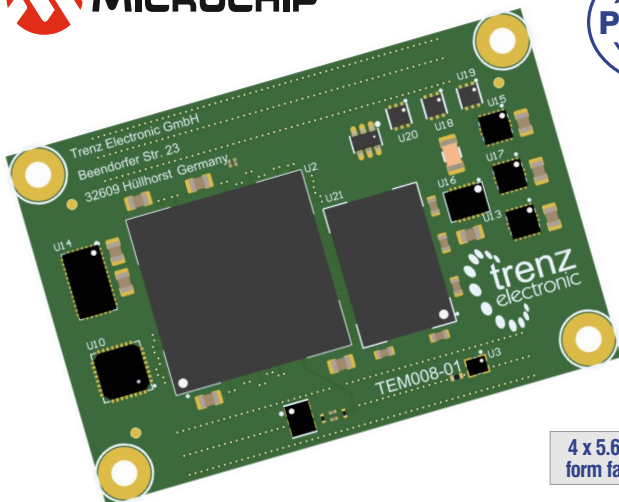
PREVIEW

4 x 5.6 cm form factor

http://trenz.org/tem0008-info
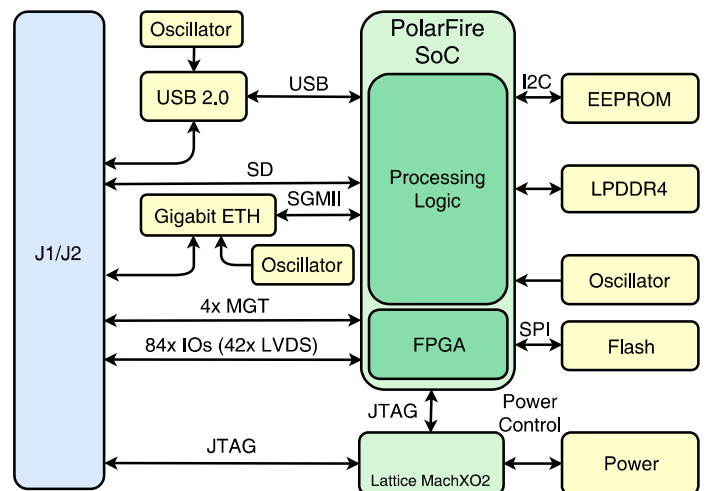
Device list	Pin Package	Connectors	SDRAM max	Flash	Ethernet	Other Features
MPFS025T, MPFS095T, MPFS160T, MPFS250T	FCVG484	2 x Samtec ADM6	1 GB LPDDR4	64 MB	1 Gbit	EEPROM MAC address, USB2.0

TE0790 and TE0790-L FTDI JTAG Adapter
XMOD Form Factor, FT2232H, Lattice XO2-256 CPLD

for AMD or **LATTICE** SEMICONDUCTOR.

Two versions available:
1) Compatible with AMD tools (TE0790)
2) Not compatible with AMD tools (TE0790-L) can be used independently.

http://trenz.org/te0790-info
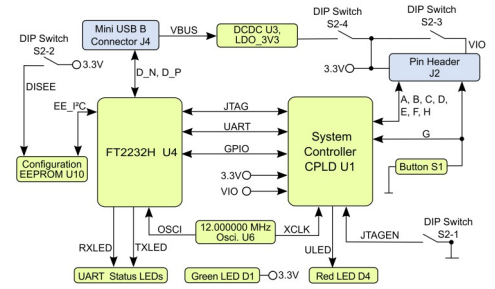
Device	Form Factor	FT2232H	Total I/O	Other Features
Lattice XO2-256 CPLD	XMOD, M3 mounting hole	Mini USB connector, channel B RX/TX LEDs, EEPROM	8 universal I/O pins	Step down DCDC converter for optional power supply via USB-power, 4 position DIP switch

TEM0009 FPGA USB-Programmer JTAG
For Development with Microchip FPGAs

for MICROCHIP

http://trenz.org/tem0009-info
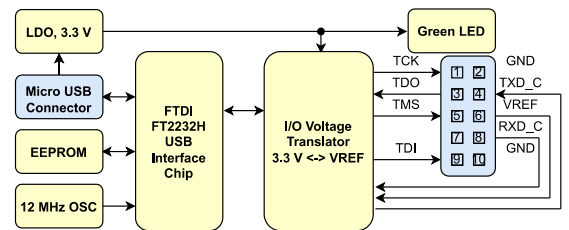
Supported by	JTAG Connector	USB	Voltage levels	Other Features
Libero SoC	Standard 2 x 5-pin header	MicroUSB connector USB2.0 HS support	0.8V - 3.6V	Green power-on LED

TEI0004 ARROW USB Programmer2
For Development with Intel® FPGAs

for intel.

http://trenz.org/tei0004-info
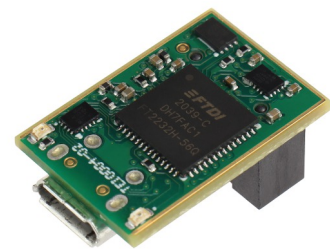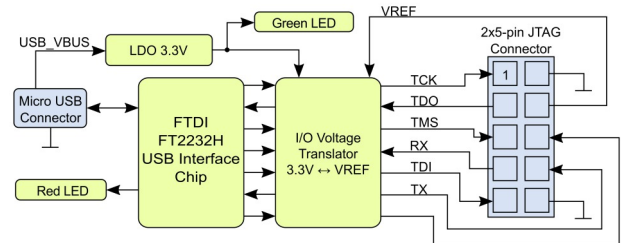
Supported by	JTAG Connector	USB	Voltage levels	Other Features
Intel® Quartus® programmer	Standard 2 x 5-pin 2.54 mm header	MicroUSB connector USB2.0 HS support	0.8V - 3.6V	Additional support for UART, red activity LED, green power-on LED

TEI0005 FPGA Programmer2 SMD Module
FT2232H based JTAG Programmer, Surface-Mount Module

for intel.

http://trenz.org/tei0005-info
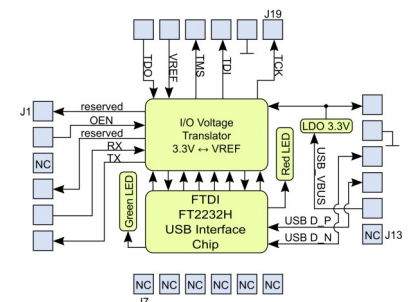
Device list	Supported	Powered	Compatible	Other Features
FTDI FT2232H USB2.0 interface	by Intel® Quartus® (JTAG mode	via USB	SMT pick and place assembly process	Additional UART channel available, activity LEDs, UART interface available, two I/O pins reserved for future use

CRUVI-HS (CR00101)

CRUVI-LS (CR00025)

CRUVI Host (CR00100)

CRUVI LS (CR00040)
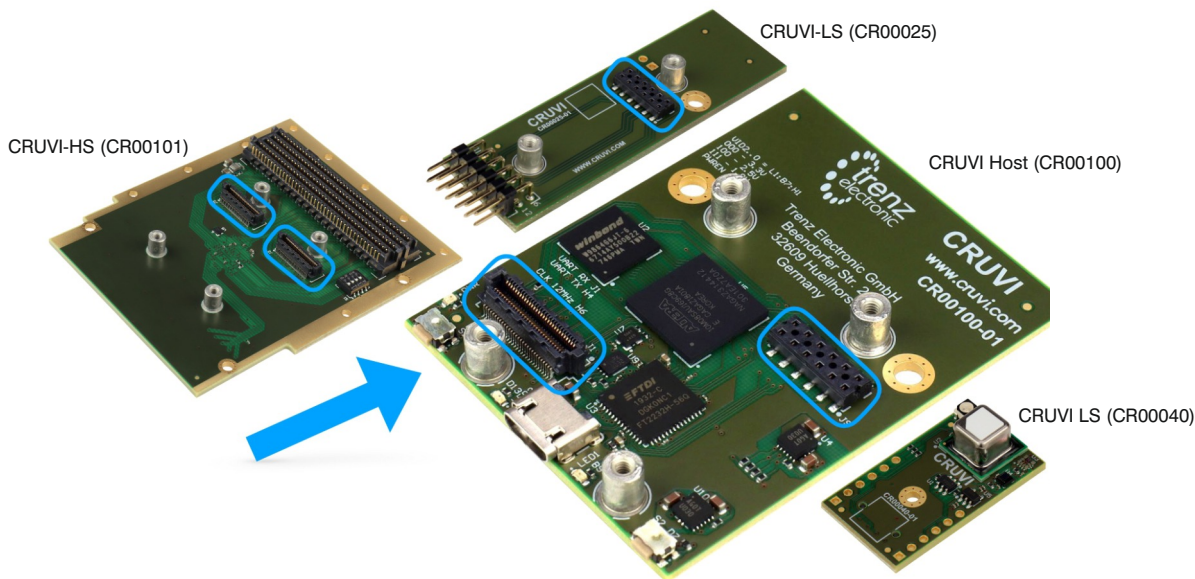
The picture shows FMC to CRUVI-HS, Pmod to CRUVI-LS, CRUVI Host with LS and HS slot and CRUVI LS modules.

CRUVI fills the space between Pmod and FMC card, it can be smaller and cheaper than SYZYGY.

	FMC LPC	SYZYGY	CRUVI HS	Pmod	CRUVI LS
Single ended I/O	68	28	37 (28+9)	8	8
Differential I/O pairs	36	10	12	-	-
Management I2C	I2C	SmartVIO	I2C/SMBUS	No	I2C (shared)
Mounting hole(s)	Yes	2 one side	1..6	No	1..6
Power Supply	Adj., 3.3V, 12V	Adj., 3.3V, 5V	Adj., 3.3V, 5V	3.3V	3.3V, 5V
License	VITA $$$	Free	Free	Free	Free

TEB0707
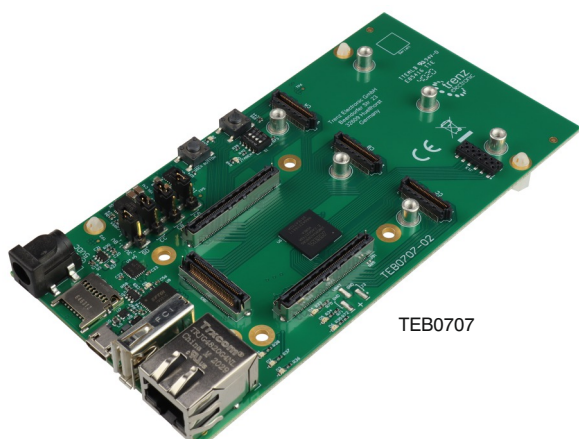
CRUVI Carrier board with 3 CRUVI slots (3 x HS, 1 x LS)

This board accepts Trenz 4 x 5 SoM and converts into a CRUVI compatible host carrier board. Three CRUVI slots are provided with HS connector support. One slot supports also LS.

CR00140
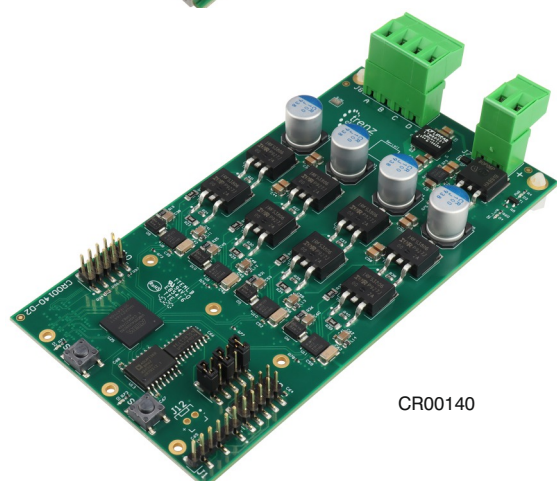
Industrial Motor controller board with CRUVI connector

This board allows motor control applications with any CRUVI carrier that supports at least one HS slot. IO Voltage range supported 1.2 to 3.3V. There are total 4 phases available for either one 3 phase or two 2 phase motors. Pin headers are available for rotation sensor connections. There is current measurement on two phases and DC link voltage.

For more information, please visit **www.cruvi.com**

CR00140 Control Development Kit
AMD Zynq™ 7000

http://trenz.org/cr00140-info
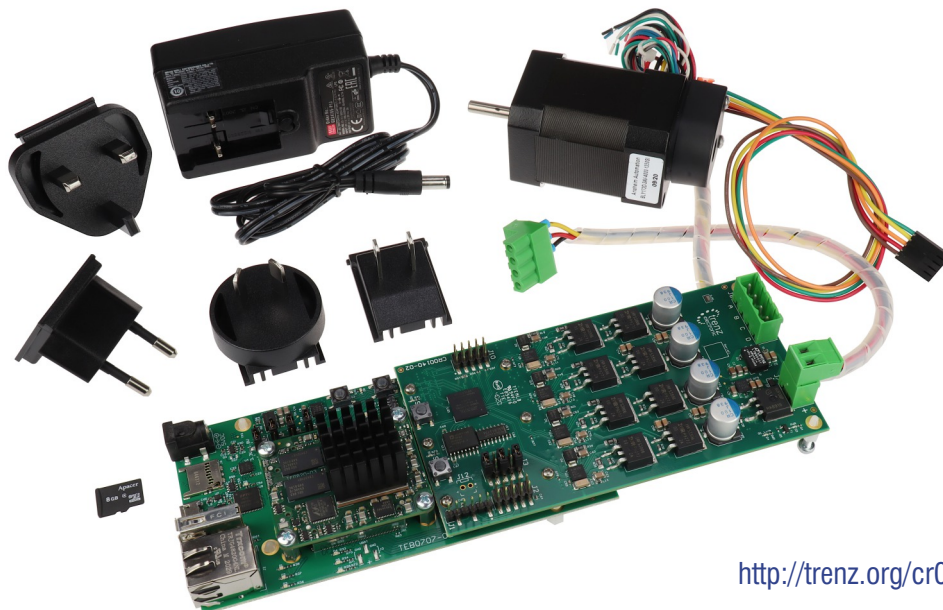
Motor Control Development Kits:

A CRUVI motor driver module CR00140-02, a carrier board TEB0707 and a MPSoC (TE0820/AMD UltraScale+™) or SoC (TE0720/AMD Zynq™7020) module including a heat sink. Supplied with a universal plug-in power supply with four adapters, a DC motor including cable for CRUVI CR00140 and an 8 GB micro SD card.

- CR00140-02-K0A with MPSoC TE0820
- CR00140-02-K1A with SoC TE0720

CR00100 CRUVI Series
Intel® MAX® 10 CRUVI, SDRAM, USB

4.5 x 5.7 cm
form factor

http://trenz.org/cr00100-info
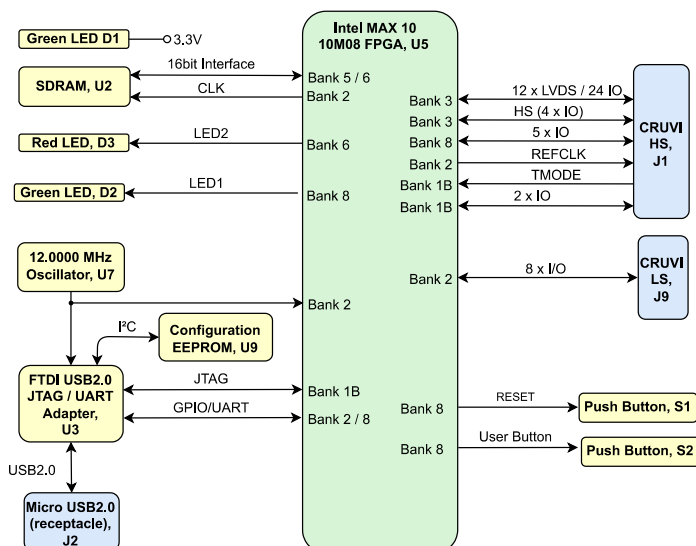
Device list	Connectors	SDRAM max	Total I/O	Other Features
10M08	CRUVI (1 x HS, 1 x LS), 2 x 34 Pin Header	8 MB	37 + 8	USB2.0, user push button and LEDs

CR00103 CRUVI Certus-NX Baseboard
Lattice Certus™-NX, HyperRAM, Flash, USB

4.5 x 5,7 cm
form factor

http://trenz.org/cr00103-info
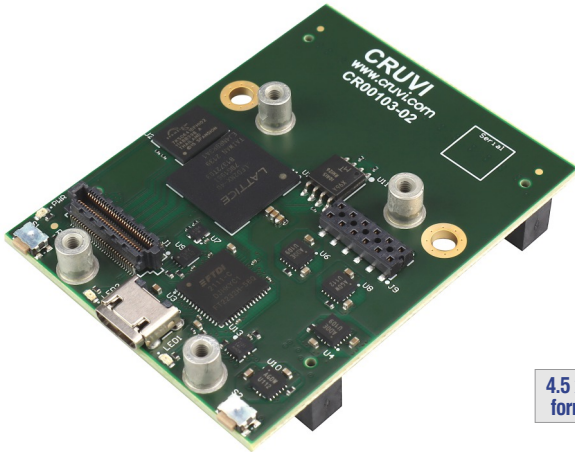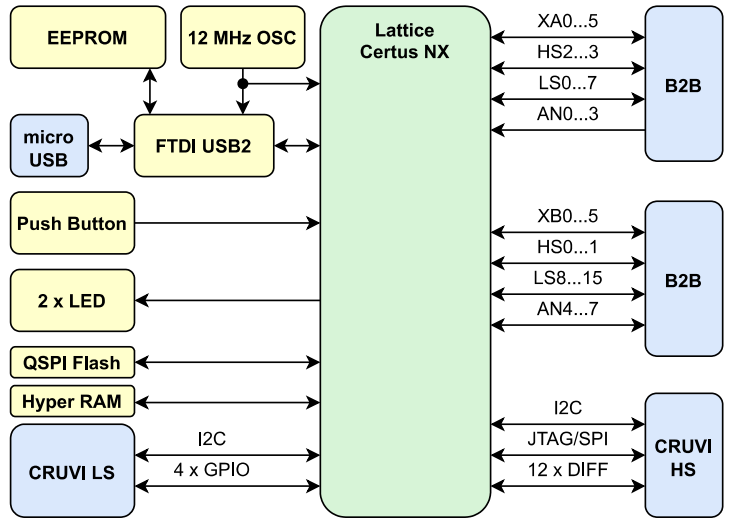
Device list	Interface	RAM	Flash	Other Features
LFD21X-40	CRUVI (2 x 34 Pin Header, 1 x High Speed 60 Pin Header, 1 x Low Speed 12 Pin Header), micro USB	16 MB HyperRAM	32 MB	USB to FIFO FTDI (JTAG/GPIO), user LEDs, push buttons

CR00109 CRUVI Development Board
Intel® Cyclone® 10 LP, with CRUVI LS and CRUVI HS, 2 x 10/100 Ethernet, microUSB

11.65 x 15 cm
form factor

http://trenz.org/cr00109-info
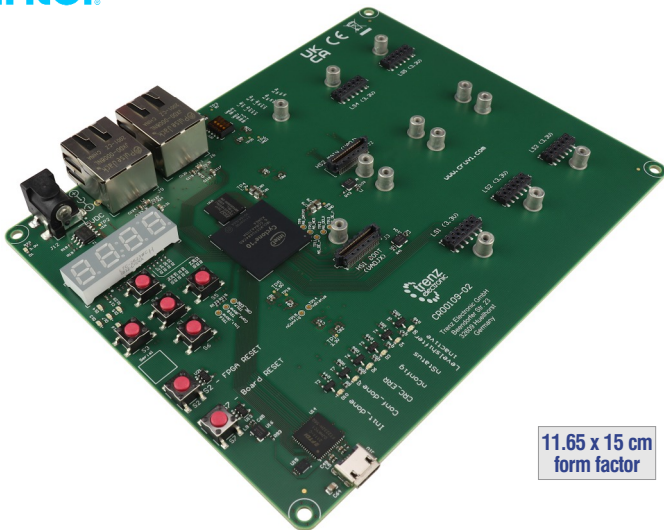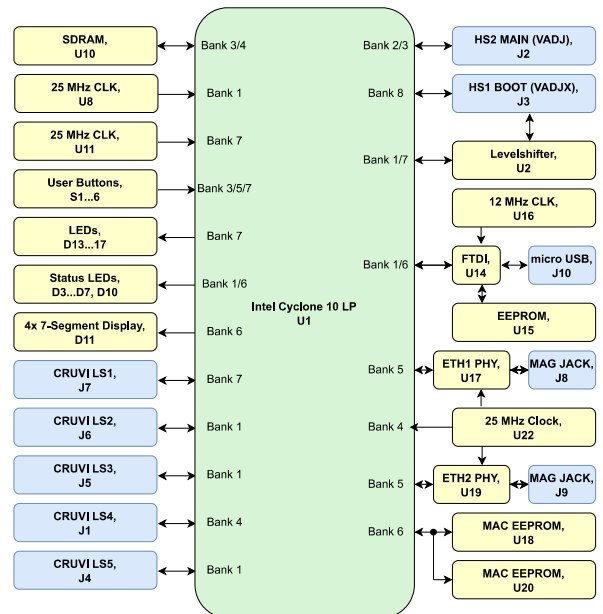
Device list	Connectors	SDRAM max	Other Features
Cyclone® 10 LP	CRUVI LS, CRUVI HS, CRUVI HS & BOOT, USB to Multipurpose FIFO IC, 2xRJ45, micro USB	8 MB SDRAM	2 x 10/100 Ethernet PHY, 2 x MAC EEPROM, Oscillator, 4 x 7-Segment-Display, user buttons, user LEDs, status LEDs

CRUVI Adapter

Small sized mezzanine module standard providing option for high speed and ultra low cost modules.

CR00025   Pmod to CRUVI low speed Host Slot

On Board
- Steel Spacer
- M3-Hole
- Board-to-Board & Mezzanine connector

Power via CRUVI
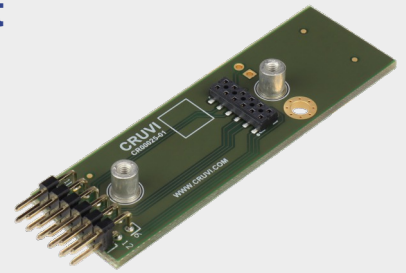
CR00026   Signal breakout debug Adapter

On Board
- CRUVI HS Host connector
- CRUVI HS Device connector
- 100 mil pin headers

Power via CRUVI
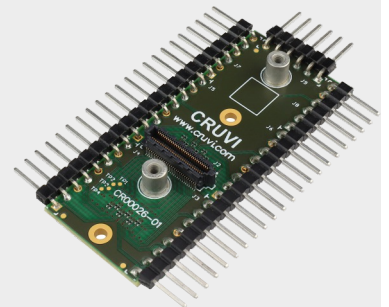
CR00200   HS Ethernet PHY Adapter

On Board
- CRUVI HS connector
- ETH PHY and 25 MHz Oscillator

Memory
- Serial EEPROM with EUI-48 Node Identity

Interface
- CRUVI and RJ45

Power via CRUVI
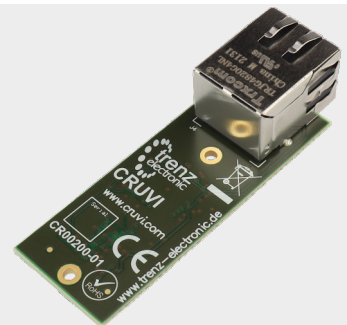
CR00202   HS Dual Ethernet PHY Adapter

On Board
- CRUVI HS connector
- 2 x ETH PHY and 25 MHz Oscillator

Memory
- 2 x Serial EEPROM with EUI-48 Node Identity

Interface
- CRUVI and 2 x RJ45

Power via CRUVI
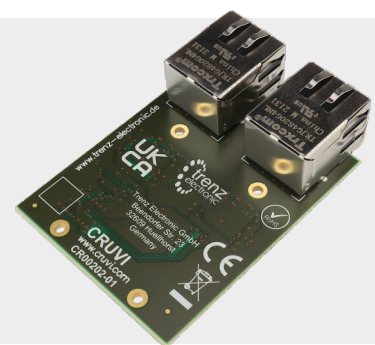
CR00240   HDMI Adapter

On Board
- Serial EEPROM with EUI-48 Node Identity
- HDMI/DVI level shifter with active DDC Puffer (PTN3363BSMP)

Interface
- Samtec ST4-30-1.50-L-D-P-TR (Ultra-Fine Pitch Header 60 pins)
- HDMI connector

Power via CRUVI
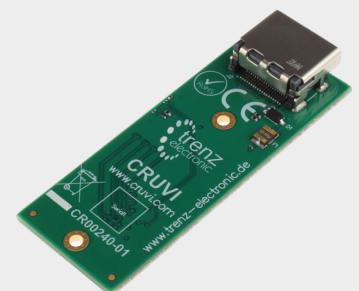
CRUVI Adapter

Small sized mezzanine module standard providing option for high speed and ultra low cost modules.

CR00045 AP Memory x8/x16 Xccela PSRAM Board

On Board
- AP Memory IoT RAM (OPI & HPI):
  256 Mbit x8/x16 1.8V 200 MHz DDR PSRAM
- Serial EEPROM with EUI-48 Node Identity
Interface
- 1.8V 200 MHz DDR x8/x16 Xccela PSRAM
- I2C
Power via CRUVI

CR00049 E.MMC expansion Module

On Board
- e.MMC: 8 GB 1,8V / 3,3V e.MMC (SDINBDG4-8G-XI2)
- Serial EEPROM with EUI-48 Node Identity
Interface
- 1,8V / 3,3V e.MMC 5.1 with HS400
- I2C
Power via CRUVI

CR00091 Loopback Adapter

On Board
- 25 Mhz Oscillator (REFCLK)
- EEPROM (SMB BUS)
- LED indicators for all three power rails and SMB_ALERT
Power via CRUVI
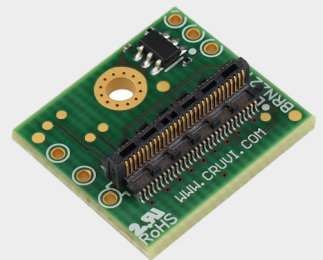
CR00101 FMC to CRUVI Adapter

On Board
- 1 x FMC HPC connector and 2 x CRUVI HS connectors
- 4 x Steel Spacer
- Intel® MAX® 10 FPGA 8kLE and Internal Flash
- 128 kbit I2C EEPROM and Clock generator 100 Mhz
- 2 x LEDs (red, green), 4 x DIP Switch
Power via CRUVI
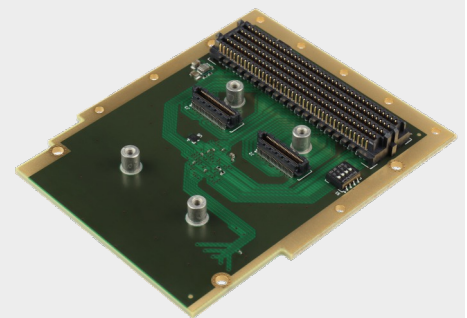
CR00300 Camera Adapter

Memory
- Serial EEPROM with EUI-48 Node Identity
Interface
- Samtec ST4-30-1.50-L-D-P-TR (Ultra-Fine Pitch Header 60 pins)
- ZIF FFC/FPC CSI-2 15 pol Camera connector
Power via CRUVI

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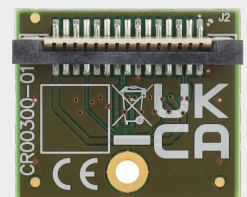
The carrier boards are baseboards for 4 x 5 SoMs, which exposes the modules B2B-connector-pins to accessible connectors and provides a whole range of on-board components to test and evaluate Trenz Electronic 4 x 5 SoMs.

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
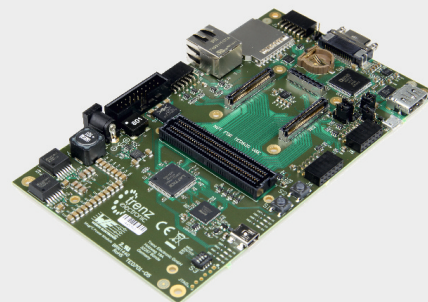
TE0703

- 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
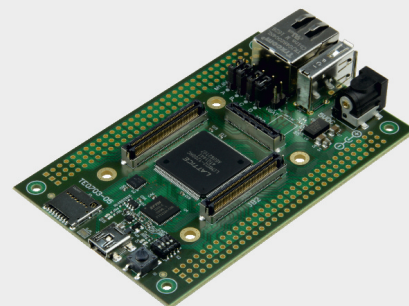
TE0705

TE0705 carrier board is a simplified version of the TE0701. It provides a cost-effective way to connect Trenz 4 x 5 modules and connect them to your own circuits. 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
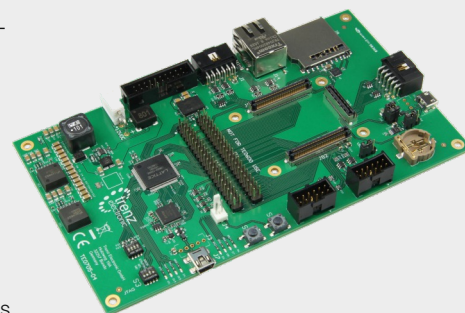
TE0706

- 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
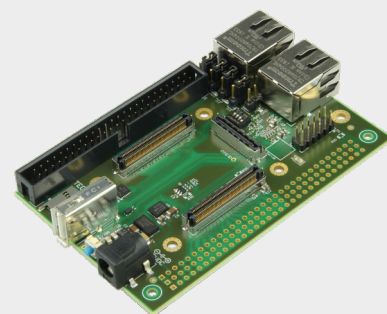
TEB0707

TEB0707 is a carrier board for 4 x 5 Trenz Electronic modules. It provides three high speed and one low speed CRUVI extension connectors.

- Intel® MAX® 10 FPGA
- FTDI FT2223
- Gigabit RJ45 LAN socket
- MicroSD card socket
- Micro USB2.0 socket
- USB A socket
- 6 x user LEDs (3 x green, 3 x red)
- 5V input power supply

http://trenz.org/te-baseboards

Trenz Electronic Carrier Boards
for modules with different form factors

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/ TEBF0818

- 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)
- Size: 170 mm × 170 mm

Designed for Trenz Electronic's
TE080x MPSoC series TE0803/0807/0808
TE081x MPSoC series TE0813/0817/0818
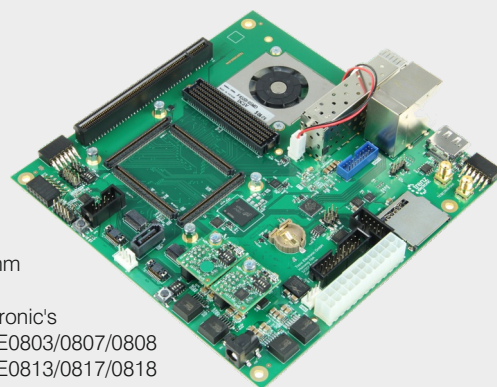
TEB0835/ TEB0836

- 4 kb EEPROM
- programmable clock generators
- I2C switch IC
- 6 x green user LEDs
- 16 x RF transformation
- reset push button
- temperature sensor
- FT2232H FTDI
- SDIO port expander
- DIP switch for mode
- Pin headers and PCIe 6 connector
- microSD card socket
- microUSB2.0

- 21 x UMCC connectors
- 6 x SMA connectors for clocks
- 2 x Samtec Razor Beam SS5
- Rj45 LAN socket
- 2 x UEC5 connectors
- 2 x UCC8 connectors
- PCI x8 card
- 12V input supply

Designed for Trenz Electronic's
TE0835 RFSoC series and
TE0836 RFSoC series
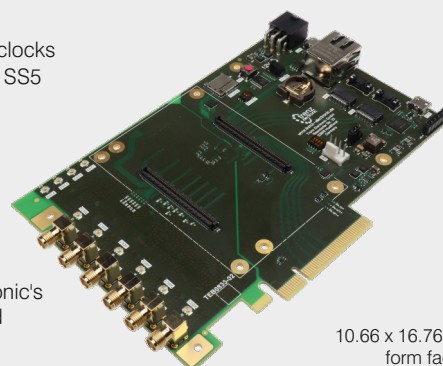
10.66 x 16.76 cm
form factor

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
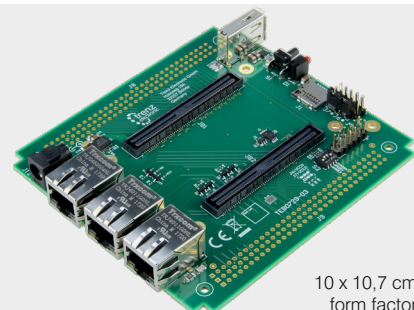
10 x 10,7 cm
form factor

TEB0745

- Trenz Electronic 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

http://trenz.org/te-baseboards
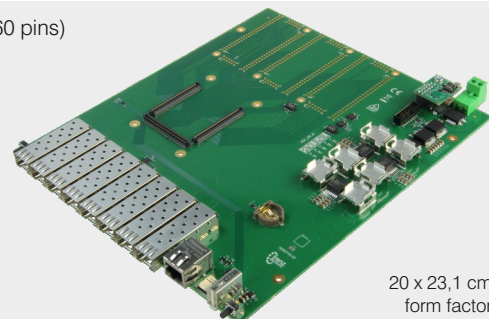
Trenz Electronic Starter Kits
Pre-assembled and ready-to-use

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 813	Starter Kit 817	Starter Kit 818
Module	TE0720	TE0729	TE0813	TE0817	TE0818
FPGA	AMD Zynq™ 7020	AMD Zynq™ 7020	AMD Zynq™ UltraScale+™	AMD Zynq™ UltraScale+™	AMD Zynq™ UltraScale+™
Baseboard	TE0703	TEB0729	TEBF0818	TEBF0818	TEBF0818
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	KK0729-02TE TE custom built	SuperGRIP	SuperGRIP	SuperGRIP
USB Cable	✓	✓	✓	✓	✓
MicroSD Card	✓	✓	✓	✓	✓
Screws & Bolts	✓	✓	✓	✓	✓

Starter Kit 720

Starter Kit 729

Starter Kit 80x

Photo shows similar product.

Cooling Solutions
for Trenz Electronic Modules

The individual cooling solutions from Trenz Electronic are required for efficient and effective cooling of the modules and serve to ensure the long-term functional reliability of the systems. The product portfolio includes both active and passive cooling solutions.

Available cooling solutions

Trenz Electronic Cooling Solution	
TE Series	**Article Number**
TE0600	26920
TE0710	26925
TE0712	26924
TE0713	26924
TE0714	KK0714-04
TE0715	26923
TE0720	33337
TE0724	30829
TE0729	KK0729-02TE
TE0741	33013, 33866
TE0745	KK0745-03
TE0803/TE0813	KK0803-04A, KK0813,02, 29665
TE0807/TE0817	KK0807-02A, KK0817-01
TE0808/TE0818	KK0808-05, KK0818-01, 29664
TE0820	33338, 28606
TE0821	33338, 28606
TE0823	28606
TE0835	KK0835-02
TE0841	28606
TEB0911	25130
TEF1001	25130
Heat Spreader Extension	KK0001-01

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

26924

KK0818-01

KK0729-02TE

Please contact us for custom solutions!

33013

KK0835-02

28606

29665

25130

KK0001-01

Available at http://trenz.org/Cooling-Solutions

Module series comparison table
for Trenz Electronic Modules

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

	Device family	Device list	Form Factor/ size [in cm]	Connectors	Processing system	max. SDRAM [in MByte]	Flash [in MByte]
AM0010	Zynq™ UltraScale+™	ZU1CG-ZU5CG, ZU1EG-ZU5EG, ZU4EV, ZU5EV	4 x 5.6	2 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4 64-bit (PS) with ECC	2 x 64
AM0030	Versal™AI Edge	VE2202, VE2302	4 x 5.6	2 x Samtec ADM6	2 x Cortex A72 2 x Cortex R5F	8192 DDR4 64-bit (PS) with ECC	64
AM0070	Zynq™ UltraScale+™ RFSoC	ZU29DR, ZU39DR,ZU49DR	6.4 x 8	5 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	4096 DDR4 64-bit (PS) with ECC 8192 DDR4 64-bit (PL)	2 x 64
TE0710	Artix™7	35T, 50T, 75T, 100T	4 x 5	2 x Samtec LSHM	MicroBlaze	512 DDR3	32
TE0711	Artix™7	35T, 50T, 75T, 100T	4 x 5	2 x Samtec LSHM	MicroBlaze	-	32
TE0712	Artix™7	35T, 50T, 75T, 100T, 200T	4 x 5	3 x Samtec LSHM	MicroBlaze	1024 DDR3	32
TE0713	Artix™7	75T, 100T, support with restrictions: 15 T, 35T, 50T	4 x 5	3 x Samtec LSHM	MicroBlaze	1024 DDR3L	32
TE0714	Artix™7	15T, 35T, 50T	4 x 3	2 x Samtec LSHM	MicroBlaze	-	16
TE0715	Zynq™7000	Z-7015, Z-7030	4 x 5	3 x Samtec LSHM	2 x Cortex A9	1024 DDR3	32
TE0716	Zynq™7000	Z-7020	4.5 x 6.5	2 x FCI BergStak	2 x Cortex A9	1024 DDR3L	32
TE0717	Spartan™7	S6, S15, S25, S50	2.5 x 3.5	1 x Samtec LSHM	MicroBlaze	-	8
TE0720	Zynq™7000	Z-7020, Z-014S	4 x 5	3 x Samtec LSHM	2 x Cortex A9	1024 DDR3	32
TE0724	Zynq™7000	Z-7010, Z7020	6 x 4	1 x Samtec ST5	2 x Cortex A9	1024 DDR3L	64
TE0725	Artix™7	15T, 35T, 50T, 75T, 100T	3.5 x 7.3	2 x 50-pin headers	MicroBlaze	8192 HyperRAM	32
TE0729	Zynq™7000	Z-7020	5.2 x 7.6	2 x Samtec BTE	2 x Cortex A9	512 DDR3	32
TE0741	Kintex™7	70T, 160T, 325T, 410T	4 x 5	3 x Samtec LSHM	MicroBlaze	-	32
TE0745	Zynq™7000	Z-7030, Z-7035, Z-7045	5.2 x 7.6	3 x Samtec ST5	2 x Cortex A9	1024 DDR3L	64
TE0763	Artix™7	200T	4.05 x 4.75	2 x Hirose DF17	MicroBlaze, HS-USB Microcontroller	1024 DDR3	32
TE0782	Zynq™7000	Z-7035, Z-7045, Z-1000	8.5 x 8.5	3 x Samtec QTH	2 x Cortex A9	1024 DDR3	32
TE0783	Zynq™7000	Z-7035, Z-7045, Z-1000	8.5 x 8.5	3 x Samtec QTH	2 x Cortex A9	2048 DDR3 64-bit (PL) 1024 DDR3 32-bit (PS)	32
TE0803/ TE0813	Zynq™ UltraScale+™	ZU2CG-ZU5CG, ZU2EG-ZU5EG, ZU4EV, ZU5EV	5.2 x 7.6	4 x Samtec ST5/ 4 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128
TE0806	Zynq™ UltraScale+™	ZU4, ZU5, ZU7, CG, EG, EV support	5.5 x 7.6	2 x Samtec ADM6	Up to 4 x CortexA53 + 2 x Cortex R5	8192 DDR4 64-bit (PS) with ECC 4096 DDR4 32-bit (PL)	2 x 64
TE0807/ TE0817	Zynq™ UltraScale+™	ZU4CG-ZU7CG, ZU4EG-ZU7EG, ZU4EV-ZU7EV	5.2 x 7.6	4 x Samtec ST5/ 4 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128
TE0808/ TE0818	Zynq™ UltraScale+™	ZU6EG, ZU9 EG, ZU15EG	5.2 x 7.6	4 x Samtec ST5/ 4 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4	128
TE0820	Zynq™ UltraScale+™	ZU2CG-ZU5CG, ZU2EG-ZU5EG, ZU4EV, ZU5EV	4 x 5	3 x Samtec LSHM	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	Up to 4 x Cortex A53 + 2 x Cortex R5	4096 DDR4	128
TE0823	Zynq™ UltraScale+™	ZU2CG-ZU5CG, ZU2EG-ZU5EG	4 x 5	3 x Samtec LSHM	Up to 4 x Cortex A53 + 2 x Cortex R5	2048 LPDDR4	128
TE0825	Zynq™ UltraScale+™	ZU2...ZU5, CG, EG, EV support, automotive support	5.4 x 7	2 x Samtec ADM6 1 x Samtec UMPT	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4 with ECC	256
TE0835/ TE0836	Zynq™ UltraScale+™ RFSoC	ZU25DR, ZU47DR	6.5 x 9	2 x Samtec ST5/ 2 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	4096 DDR4	128
TE0841	Kintex™ UltraScale™	KU35, KU40	4 x 5	3 x Samtec LSHM	MicroBlaze	4096 DDR4	64
TE0865	Zynq™ UltraScale+™	ZU11, ZU17, ZU19	7.5 x 10	4 x Samtec ADM6	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 DDR4 64-bit (PS) with ECC 8192 DDR4 64-bit (PL)	2 x 64
TE0950	Versal™AI Edge	VE2302	15 x 12	zQSFP, 2 x CRUVI HS, 2 x CRUVI LS, CSI-2, FMC	2 x Cortex A72, 2 x Cortex R5F	8192 DDR4	2 x 64
TEB0911	Zynq™ UltraScale+™	ZU6, ZU9, ZU15 (CG, EG)	40.6 × 23.43	6 x FMC HPC	Up to 4 x Cortex A53 + 2 x Cortex R5	8192 64-Bit DDR4 SODIMM (PS)	2 x 64

EEPROM	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
1 x MAC	4-64 GByte	1 Gbit	USB2.0 OTG	PL: 204 MIO: 22	4 x GTR, 4 x GTH	GPU/VCU depending on device, security controller, crypto authentication
1 x MAC	64 GByte	1 Gbit	USB2.0	100	8 x GTYP	Clock Generator for PS, PHY and DDR4, UART, I²C, SDIO
1 x MAC	8 GByte	2 x 1 Gbit	USB2.0	180 + 22 MIO 16 ADC, 16 DAC	4 x GTR 16 x GTY	OPTIGA Trust M, crypto authentication, oscillator
-	-	2 x 100 Mbit	-	112	-	Single supply
-	-	-	USB2.0 UART/FIFO	178	-	Single supply
MAC address	-	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
MAC address	-	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
1 x MAC + 64 KByte	-	1 Gbit	USB2.0	120 x HR PL	2 x PS MIOs	On board 10 x 12-bit low power SAR ADCs up to 2 MSPS, low power oscillators, USB2.0 to UART/JTAG interface, single supply
-	-	-	-	72 HR	-	HyperRAM, 100 MHz clock oscillator, red and green LED, single supply
MAC address	4 - 64 GByte	1 Gbit	USB2.0 OTG	152 + 14 MIO	-	Real time clock, single supply, automotive grade available
MAC address	-	1 Gbit	-	PL: 80 PS: 20	-	CAN, single supply
16 KByte	-	-	-	HR: 84	-	Optional POF adapter (125/250 Mbit/s), single supply
3 x MAC address	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
MAC address	-	1 Gbit	USB2.0 OTG	250 + 6 MIO	8 x GTX	Real time clock, single supply
16 KByte	-	-	-	98	-	user LEDs, push buttons, DIP Switch, USB Microcontroller
2 x MAC + 16 KByte	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
1 x MAC + 16 KByte	4 - 64 GByte	1 Gbit	USB2.0 OTG	166 + 12 MIO + 40 CPLD muxed IO	16 x GTX	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
2 x MAC address	4-64 GByte	2 x 1 Gbit	USB2.0 OTG	48 PL HD + 52 PL HP, 14 MIOs + I2C	4 x GTR, 16 x GTH	GPU/VCU depending on device, transceiver clock in-/outputs, single 5-12V power required
16 KByte	-	-	-	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply
16 KByte	-	-	-	204 + 65 MIO	4 x GTR, 16 x GTH	GPU/VCU depending on device, programmable clock generator, single supply
-	8 - 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
1 x MAC	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
1 x MAC	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
64 KByte	-	2 x 1 Gbit	-	PL: 136 +88 PS: 57	-	(Automotive), real time clock, oscillator
1 x MAC	-	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
1 x MAC	8 GByte	1 Gbit	USB2.0	240 PL HP 96 PL HD 21 MIOs	32 x GTH, 16 x GTY, 4 x GTR	12V single supply
1 x MAC	32 GByte	1 Gbit	USB2.0, OTG	16 HD 54 XP 68 FMC via Artix	8 x GTYP	AMD Artix™7 FPGA as configurable Levelshifter, JTAG + UART to USB bridge, LEDs, push button, dip switches, reset button
3 x MAC + 16 KByte	8 GByte	1 Gbit	USB2.0	408	22 x GTH	Active heat sink, GPU/VCU depending on device, M2 PCIe SSD, system controller, DisplayPort, RJ34 ETH + Dual USB3 Combo, Dual Stack SFP+, SD (bootable), USB JTAG/UART ZynqMP, USB JTAG/GPIO FMC, CAN FD (DB9 Connector), SMA (external CLK), 5-pin 24 V power connector

Module series comparison table
for Trenz Electronic Modules

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

	Device family	Device list	Form Factor/ size [in cm]	Connectors	Processing system (HW/SW)	max. SDRAM [in MByte]	Flash [in MByte]
CR00100	MAX® 10	10M08	4.48 x 5.75	CRUVI (1 x HS, 1 x LS)	–/+	8	-
TEI0001	MAX® 10	10M02, 10M04, 10M08, 10M16	2.5 x 6.15	-	–/+	8 - 64	8
TEI0003	Cyclone® 10 LP	10CL006, 10CL010, 10CL016, 10CL025	2.5 x 6.15	-	–/+	8	2
TEI0006	Cyclone® 10 GX	10CX220, 10CX150, 10CX105	6 x 8	3 x Samtec ST5	–/+	1024 - 2048	256
TEI0009	Cyclone® 10 LP	10CL055	9.5 x 11	-	–/+	64	64
TEI1000	Stratix® 10	Gx400, GX650 Sx400, SX650	6 x 8	3 x Samtec ADM6	GX: –/+ SX: +/–	2048 DDR4	64
TEI0022	Cyclone® V	5CSEMA5F31C8N	13 x 16	-	+/+	1024 DDR3 (HPS) 1024 DDR3 (FPGA)	32 for HPS 32 for FPGA
TEI0050	Cyclone® V	5CEBA2U15C8N	2.5 x 7.07	CRUVI HS, 2 x 14 pin header	+/+	8	8
TEI0187	Agilex® 5E	Device Group A5E **A**: 013, 028, 043A, 052, E065 Device Group A5E **B**: 008, 013, 028, 043, 052, 065(default)	5.2 x 7.6	3 x Samtec ADM6	+/+	2048 LPDDR4 (HPS) 2048 LPDDR4 (FPGA)	256

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

	Device family	Device list	Form Factor/ size [in cm]	Connectors	Processing system (HW/SW)	max. SDRAM [in MByte]	Flash [in MByte]
TEL0001	Mach XO2	LCMXO2-4000HC	2.5 x 6.15	Pmod, pin header, micro USB	–/–	-	-
TEL0003	CertusPro™-NX	LFCPNX-100	10.7 x 16.8 (PCIe)	CRUVI HS, CRUVI LS, CSI-2, SFP+, FMC, PCIe x4	–/+	2 x 32 RPC DRAM	32
TEL0004	Avant™ AT-E	LAV-AT-E70	11 x 16	HDMI, micro USB, MIPI CSI-2, CRUVIs	–/+	2 x 1024 LPDDR4	32
CR00103	Certus™-NX	LFD21X-40	4.5 x 5.7	micro USB2.0, CRUVI HS, CRUVI LS, 2x Samtec SSM	–/+	8 MByte HyperRAM	16/32
TE0876	Mobile FPGA	iCE40HX	3.0 x 6.5	Raspberry PI Socket, Pmod connectors, pin header	–/–	4 Mbit external SRAM	8

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

	Device family	Device list	Form Factor/ size [in cm]	Connectors	Processing system (HW/SW)	max. SDRAM [in MByte]	Flash [in MByte]
TEM0001	SmartFusion® 2	M2S005, M2S010, M2S025, M2S050, M2S060	2.5 x 6.15	JTAG and UART over micro USB2.0, 3-pin header, Pmod	+/–	8	8
TEM0005	SmartFusion® 2	M2S005, M2S010, M2S025, M2S050, M2S060	3.1 x 5.6	Samtec ST5 160 pin	+/–	256	32
TEM0007	PolarFire® SoC	MPFS025T, MPFS095T, MPFS160T, MPFS250T	4 x 5	3 x Samtec LSHM	+/–	1 Gbyte LPDDR4	64
TEM0008	PolarFire® SoC	MPFS025T, MPFS095T, MPFS160T, MPFS250T	5,6 x 3,8	2 x Samtec ADM6	+/–	1 Gbyte LPDDR4	64

EEPROM	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
Config. EEPROM	-	-	-	24 + 4	-	User Push Button and LEDs
Config. EEPROM	-	-	USB2.0	31	-	3-axis accelerometer, on-board USB Programmer, JTAG/UART over micro USB2.0 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
2 Kbit	-	1 Gbit	-	226	-	Intel® MAX® 10 as system controller (CPLD), programmable oscillator, single supply, baseboard available
2 x MAC address	-	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
-	-	-	-	GX: 248 SX: 296	18 x	Intel® MAX® 10 system controller, Status and user LED
2 Kbit	-	-	USB2.0	29	-	MEMS 3-axis accelerometer, fully calibrated single-chip temperature sensor, smoke detector, USB/JTAG programmer, single supply
Config. EEPROM	-	-	-	24 + 24	-	USB-to-JTAG/GPIO-FTDI, user push button and LEDs
1 x 2 Kbit 1 x 128 Kbit	-	1 Gbit	USB2.0 (Support USB 3.1)	331 96 Diff10 19 HPS	up to 24 channels at 28 Gbps (Group A) up to 24 channels at 17 Gbps (Group B)	configurable HPS IOs as SDIO, UART, I²C, SPI, etc. 12V single supply

EEPROM	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
4 Kbit	-	-	USB2.0, UART/FIFO	22 + 8	-	push buttons, LEDs, 100 Mhz MEMS oscillator, Power supply via USB or 5 V via pin header, USB-to-JTAG/GPIO-FTDI
1 Kbit	-	-	USB2.0/USB3.0	-	4x up to 10,3125 Gbps	Oscillator, push buttons, LEDs, 1x4 positons dip switch, PCIe or Power connector
2 x MAC address	-	2 x Gbit	micro USB	-	-	user LEDs, user push buttons, user slide switches, 5V plug
4 Kbit	-	-	USB2.0, UART/ FIFO	Rasberry PI Socket: 18, B2B: 56, CRUVI: 28	-	LEDs, user push buttons, Power supply via micro USB or pin connector, USB-to-JTAG/GPIO-FTDI, Rasberry Pi socket
2 Kbit	-	-	-	Rasberry PI Socket: 18, CRUVI: 32, Other: 4+5	-	user clock, user LEDs, push button, supported by fully open source FPGA toolchain, fast FPGA configuration from Raspberry Pi, full FPGA design flow on Raspberry Pi (all open source), push button

EEPROM	e.MMC	Ethernet PHY	USB PHY	Total I/O	Gbit Transceiver	Other Features
4 Kbit	-	-	-	22 + 8	-	User LEDs, user push button, 1 x 3-pin header for Live Probes, Power supply via micro USB or pin connector, USB-to-JTAG/GPIO-FTDI
serial EEPROM for MAC address	-	100 Mbps	-	105	-	Power supply monitor, optional crypto authentication device
serial EEPROM for MAC address	-	1 Gbit	USB2.0	HSIO: 34*, GPIO: 84 MSIO: 14	4 + 1	On-board DC-DC converter, *highly dependant on used SoC
serial EEPROM for MAC address	-	1 Gbit	USB2.0	TBD	4 x	Preview board, On board, DC-DC convector

Our VCS (Vision, Control and Sensors) systems have been designed as complete solutions for precision robotics. Here you can see the progression from the VCS[1], developed as the hardware solution for the TULIPP project, on to the VCS[2] which was designed for the VineScout project, and finally on to the newly released VCS[3].

VCS[1]

The VCS[1] is a PCIe/104 OneBank™ Development Platform. It is compatible with any of Trenz Electronic´s 40mm x 50mm System-on-Modules with an AMD® ZYNQ™ MPSoC that offer Dual-Core or Quad-Core A53 CPU. An FMC expansion interface opens up many options.

- 12x analogue inputs with a resolution of 12-bits@2kSPS
- 8x analogue outputs with a resolution of 24-bits@2kSPS
- 28x single-ended digital I/Os 5V TTL on a RPi connector
- Four USB3.0 connections
- 15x High-Speed I/O, 2.5V-only
- Ethernet, HMDI, SATA, USB2 Interfaces
- PCIe/104 Expansion connector
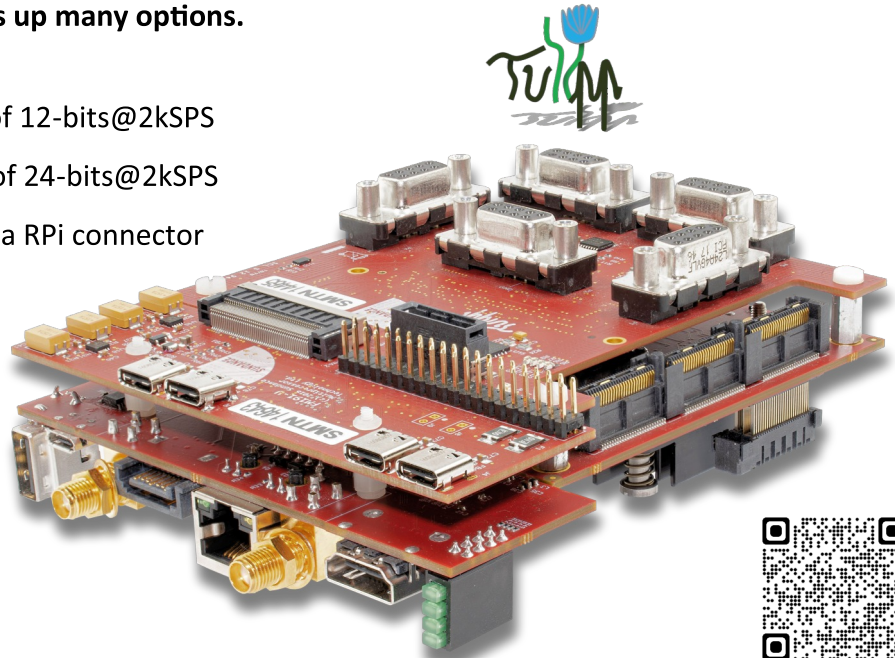
store.sundance.com/VCS1/

VCS[2]

The VCS[2] is a PCIe/104 OneBank™ Development Platform. It is compatible with any of Trenz Electronic´s 40mm x 50mm System-on-Modules with an AMD® ZYNQ™ MPSoC that offer Dual-Core or Quad-Core A53 CPU. An FMC expansion interface opens up many options.

- 12x analogue inputs with a resolution of 12-bits@2kSPS
- 8x analogue outputs with a resolution of 24-bits@2kSPS
- 26x single-ended digital I/Os 5V TTL on a RPi connector
- IEEE 802.11 a/b/g/n WiFi + Bluetooth
- Humidity and Temperature sensor & Audio I/O
- 4G + GNSS/GPS, IMU sensor
- Four USB3.0 connections
- Two 5Mbps CAN-BUS Interfaces
- PCIe/104 Expansion connector
- Ethernet, HMDI, SATA, USB2 Interfaces
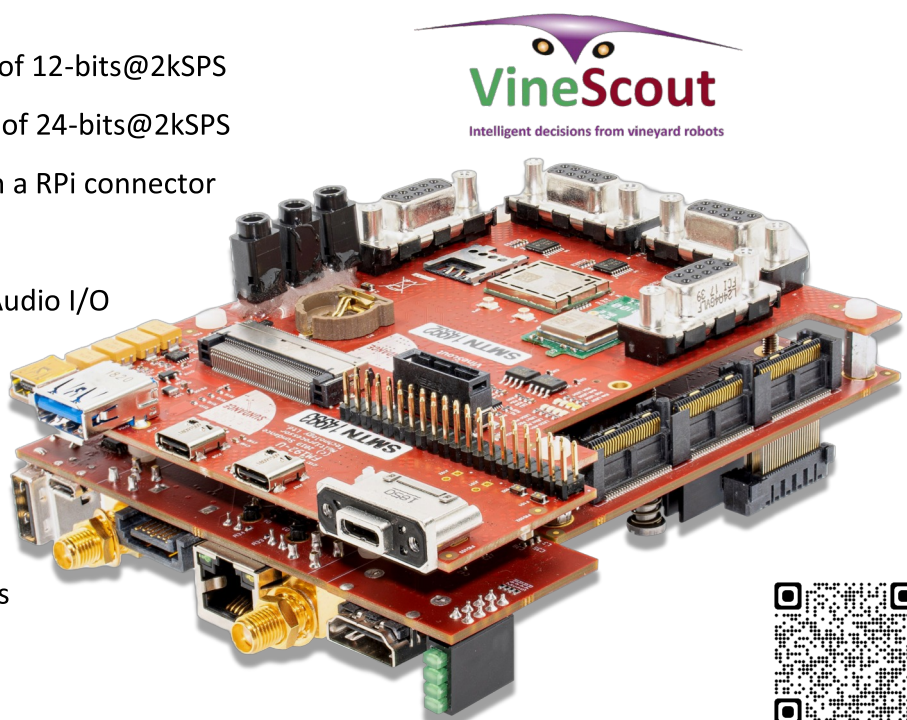
store.sundance.com/VCS2/

52

VCS³

The result of this evolution, the VCS³ is probably the Worlds smallest "Single-Board-Computer" with an AMD® ZYNQ™ device with integrated ARM CPUs and FPGA fabric. Measuring just 30mm x 50mm, this tiny workhorse can be placed almost anywhere, opening up the benefits of FPGAs to many more applications.

The VCS³ utilizes an AMD UltraScale+ MPSoC coupled with high-speed LP-DDR4 memory to produce a highly compact evaluation platform. With four 22-way FPC connectors with 14x High-Speed I/O and 3.3V power-out, a 9-axis IMU, and a CAN-BUS interface, this platform is ideally suited for autonomous machines, cameras or automation.
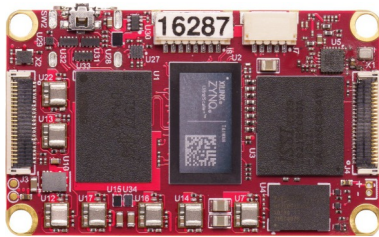
1:1 scale VCS³
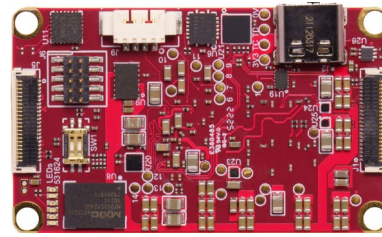
Features:

- AMD® ZYNQ® UltraScale+
  ZU1, ZU2 or ZU3 in InFO Package
- Dual or Quad A53 ARM CPU
- Four FPC connectors, 22 way
  CSI/DSI for Cameras/Displays
  3.3V Out & 56x GPIO
- 1Gb, 2Gb or 4Gb of LP-DDR4
- 64Gbit of eMMC Flash
- Dual 1Gbit QSPI ROM
- 9-axis IMU
- 5Mbps CAN-BUS
- Fast GPIO & UART
- USB-C for data connection
  and/or power supply
- Weight: 10g / 30g with heatsink
- Supply Voltage: +5V ±5%
- Typical Power Consumption:
  3 Watts
- Dimensions: 50mm x 30mm

store.sundance.com/vcs3/
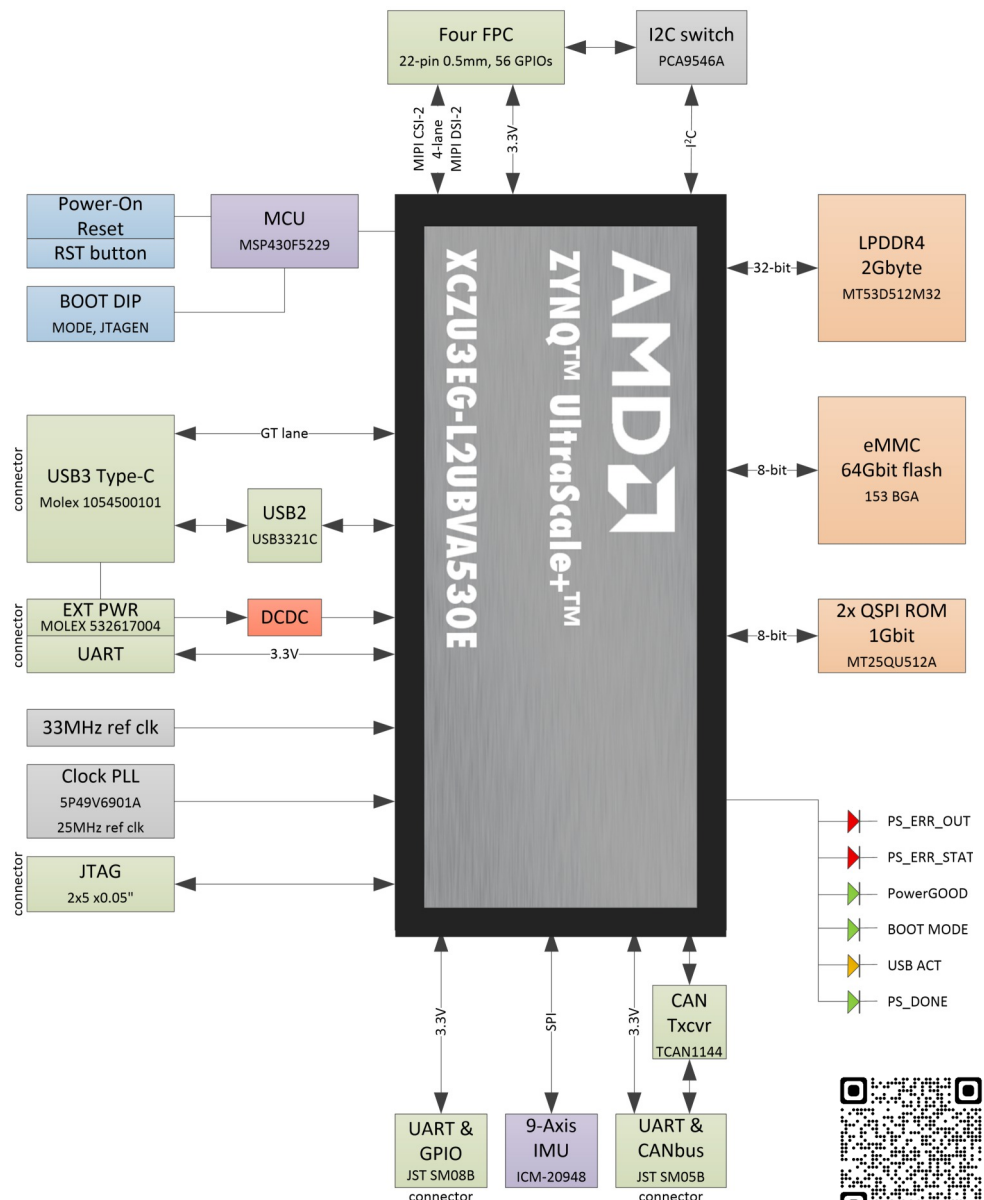
Ndigo6G-12 - versatile pulse acquisition platform

The Ndigo6G-12 offers 6,4 Gsps sample rate, 12 bits resolution and a greatly improved readout rate of 6,0 GB/s.
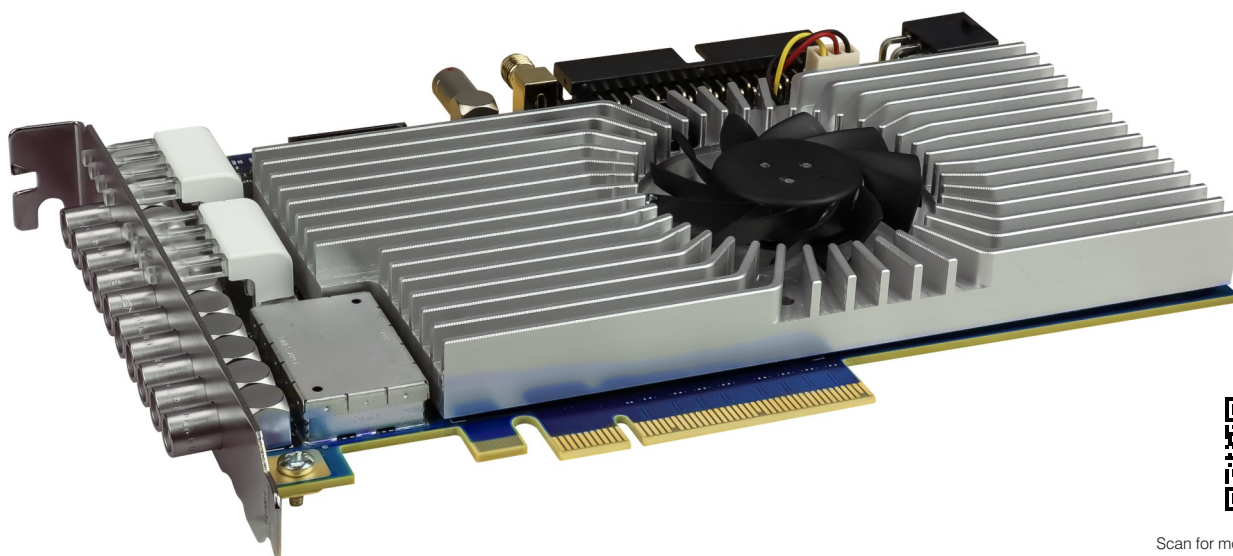
Scan for more Information!

The Ndigo6G-12 is a hybrid ADC/TDC-solution for the acquisition of short pulses. It builds on the established platform of the Ndigo5G-10, but takes it to the next level in both, performance and flexibility. The Ndigo6G-12 is particularly well-suited for time-of -flight applications like LIDAR or TOF mass spectrometry. Pulse arrival times can be measured with an accuracy down to 5 ps in combination with information on pulse shape such as area or amplitude. Four channels at 1,6 Gsps with 12 Bits resolution can be recorded independently or combined to two or one channel(s) with higher dynamic range or up to 6,4 Gsps. The Ndigo6G-12 comprises, in addition, four TDC channels with a resolution of 13 ps.

Ndigo6G-12 - Data	
Optimized for	TOF applications
ADC channels	4
TDC channels	4
Gating channels	2
Connectors	10x LEMO 00
Sample rate single channel	6400 Msps
Sample rate multi channel	1600 Msps
Resolution	12 bits
TDC Double pulse resolution	typically 4ns
TDC bin size	12 ps
Multihit	unlimited
Dead time between groups	none
TDC readout rate	30 MHits/s; 11,6 MHits/s
ADC readout rate	approx. 5000 MByte/s
Timestamp range	106 d
Common start/stop	yes/yes
Number of boards that can be synced	8
Readout interface	PCIe3 x8
Time base	50 ppb on board or external 10 MHz clock
On-board calibration data storage	√
Adjustable trigger windows	√
Overlapping events possible	√
Easy to use Windows C API	√
In-system firmware update	√
Linux support available	√

Zero suppression

Detect pulses above a certain threshold and only acquire the relevant data to massively reduce the amount of data that needs to be transferred to the host PC.

Configurable DC offset

When acquiring unipolar pulses, shift the baseline to the edge of the ADC range to double your dynamic range.

Flexible utility functions

A multitude of useful details help you to create a highly integrated setup with a minimum of external components. Using the integrated TiGer timing pattern generator can provide digital pulse patterns to control your experiment or internal triggers.

Streaming architecture

The buffers of the Ndigo6G-12 are only limited by the size of your PC's main memory. Data is streamed at a rate of 6,0 GByte/s concurrently to data acquisition. There is no dead time and latency is minimized.

TimeTagger - low cost, mid resolution time-to-digital converter

If a time resolution in a range of a few 100 ps is sufficient for your application, the TimeTagger4 can replace our high-end TDCs at a lower cost.
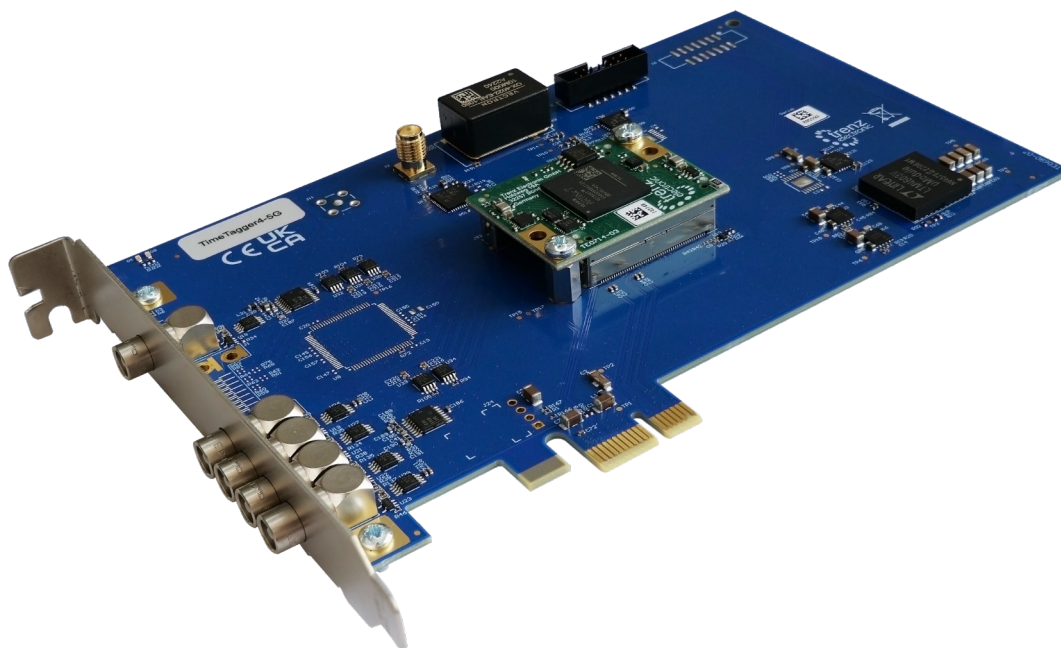
Scan for more Information!

Time to digital converter

cronologic Time Taggers are low-cost, mid-resolution time-to-digital converters ideally suitable in applications that do not require the highest resolution, but high data acquisition rates and the lowest multiple-hit dead time.

All variants of these high-bandwidth, low-cost, common-start TDCs are also available as TDC modules which can be installed via board-to-board connectors with minimal hardware effort.

- TimeTagger4-1.25G: 800 ps
- TimeTagger4-2.5G: 400 ps
- TimeTagger4-5G: 200 ps

Low cost

The TimeTagger4 is available at the lowest cost, while still providing picosecond resolution.

Bipolar

The threshold discriminators can use positive or negative threshold with configurable voltage. This allows you to use the xTDC with a wide range of detectors or constant fraction discriminators (CFD).

TiGer timing generator

All inputs can also be used to output periodic pulse patterns to control your setup. The exact timing of these is measured by the TDC.

TimeTagger - Data	
Optimized for	low cost
TDC channels	1 start & 4 stop channels
Additional inputs	-
Connectors	5x LEMO 00
Bin size	800 / 400 / 200 ps
Double pulse resolution	2 bins
Multihit	1000x per start event
Dead time between groups	none
Readout rate	60 MHits/s total; 40 MHits/s per channel
Timestamp range	1,67 ms / 430 ms extended
Number of boards that can be synced	no sync possible
Common start/stop	yes / no
Readout interface	PCIe x1 @ 400 MB/s
Time base	50 ppb on board
Linux support available	yes

Ndigo-Crate: Your solution for combining serveral PCIe cards

Ndigo Crate

With the Ndigo Crate it is possible to use up to 8 PCIe boards with a PC. The connection of the external chassis to the PC happens over PCIe 2 x16 for a full duplex bandwidth of 2x 8 GByte/s.

The enclosure was specifically designed to operate multiple synchronized cronologic digitizer boards to create a high speed data acquisition system. It can also be used to house other DAQ cards, GPUs for high performance computing, storage adapters or networking equipment.

The extension is fully transparent. The operating system can't distinguish between boards in the PCIe expansion box and boards inside the PC itself. No drivers are required.

The slot covers are on the front side of the enclosure to easily see status information and plug in cables during operation.

The crate is delivered as a set with cable and PC link board.

Scan for more Information!

Facts	Crate	Crate-3	Crate-5
Connection to Host	PCIe 2.0 x16	PCIe 2.0 x16	PCIe 2.0 x16
Bandwidth to Host	8 GByte/s	8 GByte/s	8 GByte/s
Performace relative to 10Gbps Thunderbolt link	8x	8x	8x
PCIe3 x16 slots with 8 lanes	-	2	2
PCIe3 x16 slots with 4 lanes	-	3	3
PCIe2 x16 slots with 4 lanes	8	-	-
PCI slots 5V, 32 Bit, 33MHz	-	-	2
PCI slots 3V, 32 Bit, 66MHz	-	2	-
Availability	now	now	now
Cable and link boards	included	included	included
Cable Length	3 meters (1m, 2m and 5m upon request)		

Innovative, flexible, and technically adept – these are the cornerstones of our customer relationships. Our extensive project experience enables us to collaborate with other companies in developing innovative solutions and successfully bringing them to market.

Let's delve into some of our notable collaborations:

The most powerful 4K Camera (Off the shelve):
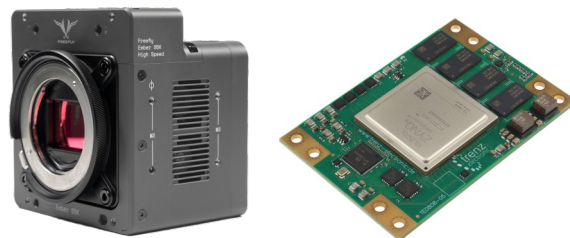
In close partnership with Freefly, we supply them with the processing hardware (an off the shelf product) for their Ember Camera.
This powerful camera is specifically designed for aerial photography and drone flights. It stands out for its compact size, high image quality, and advanced stabilization technology. Inside the camera is the Trenz Electronic TE0808 module, which provides impressive images. The Ember Camera allows breathtaking aerial shots and is an essential tool for professional filmmakers and photographers.

"Freefly chose the Trenz TE0808 to help speed the design of our latest camera 'Ember'. Trenz delivers high quality parts with the connectivity and processing we need to enable cutting edge imaging systems" - Tabb Firchau (Freefly CEO)

Shift-Left solutions (Assembly variant / custom solution):
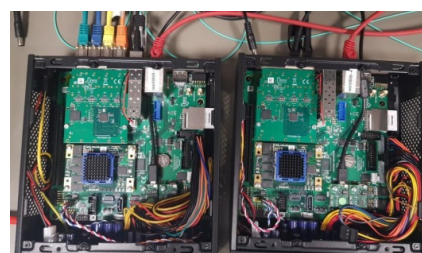
Trenz Electronic GmbH and MLE have established a close engineering collaboration, and a track record of "Shift-Left", namely, accelerating FPGA projects by integrating FPGA Full System Stacks with off-the-shelf FPGA System-on-Modules (SoMs) for Compute, Video, Storage and/or Network Acceleration. The "Shift-Left" solutions not only shorten time-to-market but also reduce the risks and costs. In the project of TEBF0807, we completed and validated within days the PoC of low-latency SD-WAN access on the SoM and Devkit's carrierboard with the Network Protocol Acceleration Platform Full System Stacks integrated. Then we quickly designed a custom carrierboard that contained only the I/Os required by the client for low-risk cost optimization. The design re-use method greatly reduces the development time, costs and risks to shift-left clients' projects.

RFSoC Chip-Down for LIDAR detection in an automotive surrounding:

TEC0203 represents a bespoke board, tailored for integration within the LIDAR system. Its primary function revolves around the digitization of analogue signals sourced from optical sensors, followed by the processing of resulting digital signals. At its core lies a AMD Zynq™ UltraScale+™ RFSoC, complemented by 4 x 512 MByte DDR4 SDRAM for robust memory capabilities. Additionally, the board is equipped with a dual 512 MByte Flash memory configuration, essential for both initialization and ongoing operations. The analog part of the module also includes additional analog-to-digital converters (ADCs) for processing low-frequency signals. Ensuring efficient power distribution, the board features potent switch-mode power supplies catering to all onboard voltages. A dedicated system controller housed on LCMXO3D enhances operational control and coordination. Furthermore, facilitating seamless connectivity and control, the board incorporates a PCIe, Ethernet, USB2.0.

Trenz Electronic SMD In-house Production
Full SMT production since 2014

The modern, production-oriented storage system is an automated, highly flexible and expandable buffer storage unit for electronic components. It is ready for fast and smooth changeovers in our SMT line.

Trenz Electronic uses printing technology to make it possible to dispense solder paste for the most challenging circuit boards and components, with micrometer accuracy, maximum speed and perfect quality solder joints.

In the complex process of solder paste inspection (SPI), Trenz Electronic has the possibility to measure the paste volume with the highest precision in 3D.
Furthermore, possible defects and bridges are detected.

To produce even faster, we uses several production lines at the same time. Here, we can easily switch from full volume to batch size one and handle a wider variety of components with uncompromising manufacturing quality.

Trenz Electronic SMD In-house Production
Full SMT production since 2014

The Automatic Optical Inspection (AOI) is used to detect and report tolerance deviations in production using an image processing techniques.

For some applications, THT placement remains indispensable. THT assembly creates a strong connection between the components and the PCB. This makes it ideal for larger components that are exposed to high power and high voltages.

With our X-ray machine, we use leading technology for precise analyses. The detailed 3D visualization masters the special requirements of our field of application.

Our new state-of-the-art selective soldering machine, specially designed for PCB assembly, optimises the entire manufacturing process. With the innovative EcoSelect 4 technology, electronic components can be soldered precisely and to the highest quality. The intuitive control software enables efficient operation and quick adaptation to individual requirements.
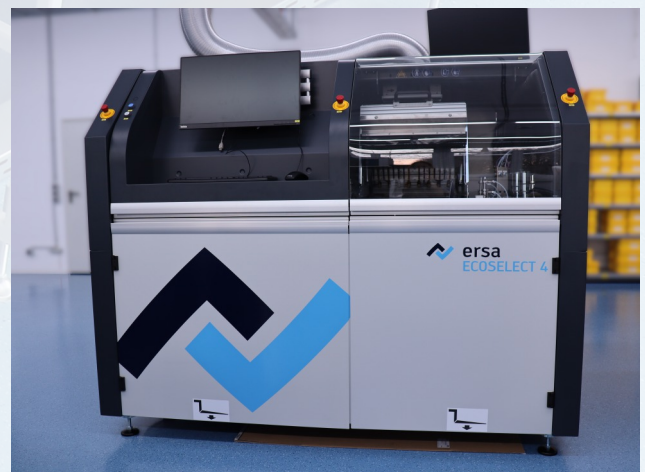
Official Trenz Electronic Distributor List as of February 2024

Current list with address is 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
Web: de.rs-online.com
E-mail: bestellung@rs-components.com

EMEA

AVNET Silica
Web: www.avnet-silica.com
E-mail: trenz_sales@avnet.eu

APAC

AVNET Asia Pacific
Web: avnet.com/apac
E-mail: xilinxapac@avnet.com

🇨🇳 China & 🇹🇼 Taiwan

Future Linking Solution Tech Co. Ltd.
Web: www.fulso.com
E-mail: liu@fulso.com

Haley Technology Co. Ltd.
Web: www.haleytech.com
E-mail: sales@haleytech.com

🇨🇿 Czech Republic + 🇸🇰 Slovakia

DFC Design, s.r.o.
Web: www.dfcdesign.cz
E-mail: info@dfcdesign.cz

🇫🇷 France

ERTIS SASU
Web: www.ertis.fr
E-mail: sales@ertis.fr

Lextronic
Web: www.lextronic.fr
E-mail: lextronic@lextronic.fr

🇮🇳 India

Microembesys Technologies Pvt Ltd.
Web: www.microembesys.com
E-mail: info@microembesys.com

ApexPlus Technologies
Web: www.apexplustech.com
E-mail: info@apexplustech.com

Sinelec Technologies Deutschland GmbH
Web: www.sinelec-tech.com
E-mail: contact@sinelec-tech.com
(Europe and India)

🇮🇹 Italy

mirifica s.r.l.
Web: www.mirifica.it
E-mail: store@mirifica.it

🇯🇵 Japan

Tokushu Denshi Kairo Inc.
Web: www.tokudenkairo.co.jp
E-mail: info@tokudenkairo.co.jp

🇰🇷 Korea

Inipro Inc.
Web: www.inipro.net
E-mail: webmaster@inipro.net

Neocess Co., Ltd.
Web: www.neocess.co.kr
E-mail: james@neocess.co.kr

Aitech Inc.
Web: www.ai-tech.co.kr
E-mail: info@ai-tech.co.kr

🇵🇱 Poland

BTC Korparacja
Web: www.kamami.pl
E-mail: sprzedaz@kamami.pl

🇪🇸 Spain

Cyberall Group
Web: www.cyberallgroup.com
E-mail: sales@cyberallgroup.com

🇮🇱 Israel

STG International Ltd.
Web: www.stggroup.co.il
E-mail: oren.cohen@stggroup.co.il

🇹🇷 Turkey

EKOM Elektronik A.S.
Web: www.e-kom.com
E-mail: info@e-kom.com

NanoMagnetics Instruments
Web: www.nanomagnetics-inst.com
E-mail: sales@nanomagnetics-inst.com

Same Elektronik San. Ve Tic. A.S.
Web: www.sameas.com.tr
E-mail: same@sameas.com.tr

🇬🇧 United Kingdom

Sundance Multiprocessor Technology Ltd.
Web: www.sundance.com
E-mail: trenz@sundance.com

🇺🇸 USA

Concurrent EDA LLC
Web: www.concurrenteda.com
E-mail: trenz@concurrenteda.com

Missing Link Electronics, Inc.
Web: www.missinglinkelectronics.com
E-mail: sales-web@missinglinkelectronics.com

🇨🇦 Canada

MaxCom Global Inc.
Web: www.maxcomglobal.ca
E-mail: richard@maxcomglobal.ca

---
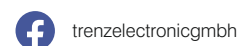
trenzelectronicgmbh

TrenzElectronic

trenz-electronic-GmbH