TE0808-04-9GI21-AS Starter Kit with Zynq UltraScale+ ZU9 FPGA Module

Order number: TE0808-04-9GI21-AS

Product information "TE0808-04-9GI21-AS Starter Kit with Zynq UltraScale+ ZU9 FPGA Module"

This article is the replacement for the TE0808-04-09-2IE-S. All changes caused by the new revision of the buildt-in module are included in the Product Change Notification (PCN).

The Trenz Electronic Starter Kit TE0808-04-9GI21-AS consists of a TE0808-04-9GI21-A module with ZU9 on a TEBF0808-04A base board including a pre-assembled heatsink, in a black Core V1 Mini-ITX Enclosure. Supplied with a Be Quiet! 400 W power supply for the enclosure, 2 x XMOD FTDI JTAG Adapter, an 8 GB micro SD card, an USB cable, screws and bolts.

The Module: TE0808-04-9GI21-A

The Trenz Electronic TE0808-04-9GI21-A is a MPSoC module with industrial temperature grade integrating a Xilinx Zynq UltraScale+, 4 GByte DDR4 SDRAM, 128 MByte Flash memory for configuration and operation, 20 high speed serial transceivers, and powerful switch-mode power supplies for all on-board voltages. A large number of configurable I/O's is provided via rugged high-speed stacking connections.

Key Features

- Xilinx Zynq UltraScale+ XCZU9EG-2FFVC900I
- ZU9EG 900 Pin Packages
- 3 mm mounting holes for skyline heat spreader
- Size: 52 x 76 mm
- B2B Connectors: 4 x 160 pin
- Rugged for shock and high vibration
- 4 GByte 64-Bit DDR4 SDRAM
- 128 MByte SPI Boot Flash (dual parallel)
- User I/Os
  - 65 x PS MIOs, 48 x PL HD GPIOs, 156 x PL HP GIPIOs (3 banks)
  - Serial transceivers: 4 x GTR + 16 x GTH
  - Transceiver clocks inputs and outputs
  - PLL clock generator inputs and outputs
- Si5345 - 10 output PLL
- All power supplies on board, single 3.3 V Power required
  - 14 on-board DC/DC regulators and 13 LDOs
  - LP, FP, PL separately controlled power domains
- Support for all boot modes (except NAND) and scenarios
- Support for any combination of PS connected peripherals
- Evenly spread supply pins for good signal integrity

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

Recommended Software

Vivado Design Suite - HLx Edition Download

Vivado Design Suite HLx Editions include Partial Reconfiguration at no additional cost with the Vivado HL Design Edition and HL System Edition. In-warranty users can regenerate their licenses to gain access to this feature.

Overview of all editions of Vivado Design Suite

Xilinx Licensing FAQ

The Base Board: TEBF0808-04A

The Trenz Electronic TEBF0808 UltraITX+ base board has been developed individually for the TE0808 UltraSOM+ MPSoC.

All the latest information on the article can be found at http://trenz.org/tebf0808-info.

Key Features

- Mini-ITX form factor, PC enclosure compatible
- ATX-24 power supply connector
- Optional 12 V standard power plug
- Headers
- Intel 10-pin HDA Audio
- Intel 9-pin Power-/Reset-Button, Power-/HD-LED
- PC-BEEPER
- On-board Power- / Reset-Switches
- 2 x Configuration 4-bit DIP-switches
- 2 x Optional 4-wire PWM fan connectors
- PCIe Slot - one PCIe lane (16 lane connector)
- CAN FD Transceiver (10 Pin IDC connector and 6-pin header)
- 4 x On-board configuration EEPROMs (1x Microchip 24LC128-I/ST, 3x Microchip 24AA025E48T-I/OT)
- Dual SFP+ Connector (2x1 Cage)
- 1 x DisplayPort (single lane)
- 1 x SATA Connector
- 2 x USB 3.0 A Connector (Superspeed Host Port (Highspeed at USB 2.0))
- 1 x USB 3.0 on-board connector with two ports
- FMC HPC Slot (FMC_VADJ max. VCCIO)
- FMC Fan
- Gigabit Ethernet RGMII PHY with RJ45 MagJack
- All carrier board peripherals' I²C interfaces muxed to MPSoC's I²C interface
- Quad programmable PLL clock generator SI5338A
- 2x SMA coaxial connectors for clock signals
- MicroSD- / MMC-Card Socket (bootable)
- 32 Gbit (4 GByte) on-board eMMC flash (8 banks a 4 Gbit)
- 2 x System Controller CPLDs Lattice MachXO2 1200 HC
- 1 x Samtec FireFly (4 GT lanes bidirectional)
- 1 x Samtec FireFly connector for reverse loopback
- 2 pre-assembled TE0790 JTAG/UART header ('XMOD FTDI JTAG Adapter'-compatible) for programming MPSoC and SC CPLDs
- 20-pin ARM JTAG Connector (PS JTAG0)
- 3 x Pmod connector (GPIO's and I²C interface to SC CPLDs and MPSoC module)
- On-board DC-DC PowerSoCs

PC Enclosure Accessible I/O

- PCIe
- FMC
- Dual SFP+
- RJ45 Gigabit Ethernet
- 2x USB3 Host
- Displayport
- microSD
- Two LEDs
- CAN FD (using DB9 to IDC10 Cable)

Core V1 Mini-ITX Enclosure - Technical Features

- Dimensions: 260 x 276 x 316 mm (B x H x T)
- Material: Steel
- Colour: Black
- Drive Slots: 2 x 3.5 inch (intern, 3.5 inch) and 2 x 2.5 inch (intern, 2.5 inch)
- Expansion slots: 2
- I/O-Panel: 2 x USB 3.0 and 1 x Audio In/Out each
- Maximum graphic card lenght: 255 mm (inner enclosure)
- Maximum graphic card lenght: 285 mm (outer enclosure)
- Maximum CPU cooler height: 140 mm
- Maximum lenght power supply: 200 mm

Scope of Delivery - Starter Kit

- 1 x Core V1 Mini-ITX Enclosure- black with viewing window and removable sled walls
- 1 x Power supply Be quiet! BN142 System Power 7, 400 Watt, 12 V, ATX 2.3 with fan
- 1 x TE0808-04-9GI21-A MPSoC module with ZU9 (industrial temperature range)
- 1 x TEBF0808-04A carrier board
- 1 x Heatsink MBH31001-15W/2.6, pre-assembled
- 1 x TE0790-03 XMOD FTDI JTAG adapter (compatible with Xilinx-Tools), pre-assembled
- 1 x TE0790-03L XMOD FTDI JTAG adapter (independent from Xilinx-Tools), pre-assembled
- 1 x 8 GB Class 4 microSDHC card
- 1 x USB cable, Type A to Type B Mini, 2 meter length
- 2 x Phillips screws, M3 x 6, pan head, zinc coated
- 2 x Spacer bolts, M3, 10 mm

Additional Information

- Manufacturer's article number: TE0808-04-9GI21-AS
- Trenz Electronic TE0808 Starter Kit Wiki
- Support Forum

All modules produced by Trenz Electronic are developed and manufactured in Germany.

Starter Kit 808

- Created by John Hartfiel, last modified on 07 05, 2019

This Trenz Electronic Starter Kit consists of a TE0808 module on a TEBF0808 base board in Mini-ITX Enclosure. See shop link for detailed content.

Wiki Links

- TE0808 - UltraSoM+ - Wiki with TRM, reference projects, application notes and more
- TE0808 Resources - Links to all TE0808 Resources
- TEBF0808 - Wiki with TRM, application notes and more
- TEBF0808 Resources - Links to all TEBF0808 Resources
- TE0790 - XMOD - Wiki with TRM, application notes and more
- TE0790 Resources - Links to all TE0790 Resources
- Vivado/SDK/SDSoC - Short instructions for Vivado, SDK, SDSoC
- Project Delivery - Xilinx devices - General descriptions of reference designs and content

Download Links

- TE0808 Download Area - contains various reference designs, schematics, hardware designs, 3D models and more
- TEBF0808 Download Area - contains schematics, hardware designs, 3D models and more
- TE0790-XMOD Download Area - contains firmware with projects, schematics, hardware designs, 3D models and more
- TE Master Pinout - Excel Sheet as Pinout-Viewer and XDC-Generator

Shop Links

- Shop TE0808-Starter-Kit - contains prices, available stock, disposability, scope of delivery and more

Xilinx Software and Driver

- Vivado Design Suite - Xilinx Design Software with JTAG drivers and documentation
- Xilinx Download Area - All Xilinx Software, Device Models and Libraries

Additional Documentation

- Wiki Links
- Download Links
- Shop Links
- Xilinx Software and Driver
- Additional Documentation
- Important Notes
- Getting Started
- Starter Kit Basic
- Main Power Enclosure Location
- Power Button , Reset Button, HDD LED and Power LED Enclosure Location
- Default DIP Switch Settings
- SI5345 NVM Programming
- Starter Kit Cable Connection
- ATX Power
- Module
- FMC FAN
- XMODs
- Enclosure USB
- Enclosure FAN1 and HDAUDIO
- Enclosure Power Button , Reset Button, HDD LED and Power LED
- Support

Important Notes

Do not change XMOD DIP-Switch settings on TEBF0808. Do not swap the XMOD adapters the one marked with green dot must be closer to the SoM

ES devices are not included in all Vivado versions, for ES1 only:

activate beta device see: FAQ - How can I activate beta devices?
For all Starter Kit's shipped before 2017-06-21:

Enclosure Power and HD LED was swapped on connector. See "Enclosure Power Button, Reset Button, HDD LED and Power LED" section for correct connection.

Getting Started

- TEBF0808 Getting Started - Basic note to start up Carrier with TE080x modules

Starter Kit Basic

Main Power Enclosure Location

Power Button , Reset Button, HDD LED and Power LED Enclosure Location

Default DIP Switch Settings

Do not change XMOD DIP-Switch settings on TEBF0808. Do not swap the XMOD adapters the one marked with green dot must be closer to the SoM

TEBF0808				TE0790-02 (with green dot)		TE0790-02L	
DIP-Schalter	S4	DIP-Schalter	S5	DIP-Schalter	S1	DIP-Schalter	S1
S4.1	OFF	S5.1	ON	S1.1	ON	S1.1	ON
S4.2	OFF	S5.2	ON	S1.2	OFF	S1.2	OFF
S4.3	OFF	S5.3	OFF	S1.3	OFF	S1.3	OFF
S4.4	ON	S5.4	OFF	S1.4	OFF	S1.4	OFF

Note: with CPLD Firmware REV06 or newer, S4.4 can be set to OFF, to save power, if Starter Kit is powered off with Power Button.

For more information, see:TEBF0808

SI5345 NVM Programming

SI5345 NVM on the module is not programmed on factory, so modified FSBL is needed to get running output CLKS.

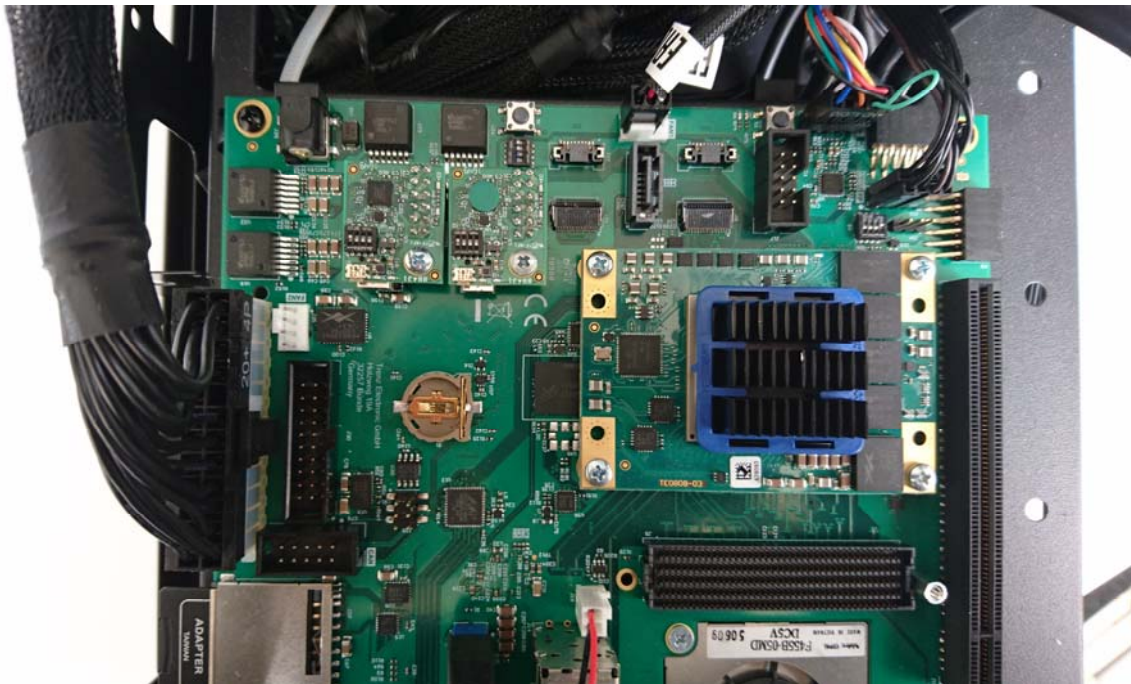It is possible to program NVM of the SI5345 2 times, see Si5345

Starter Kit Cable Connection

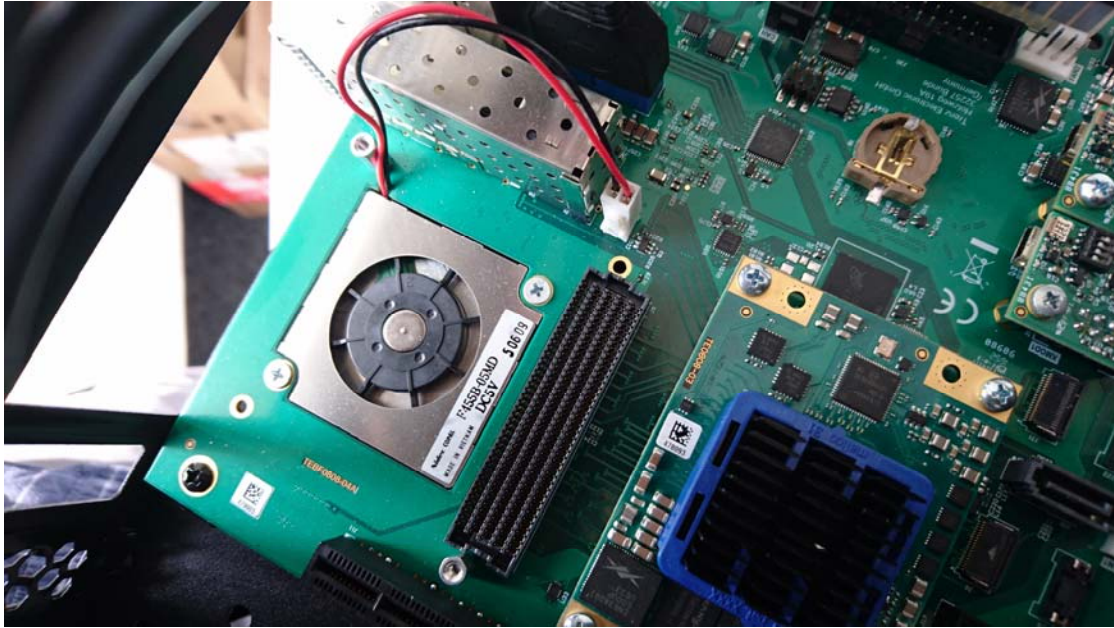Starter Kit will be shipped with all cable connected.
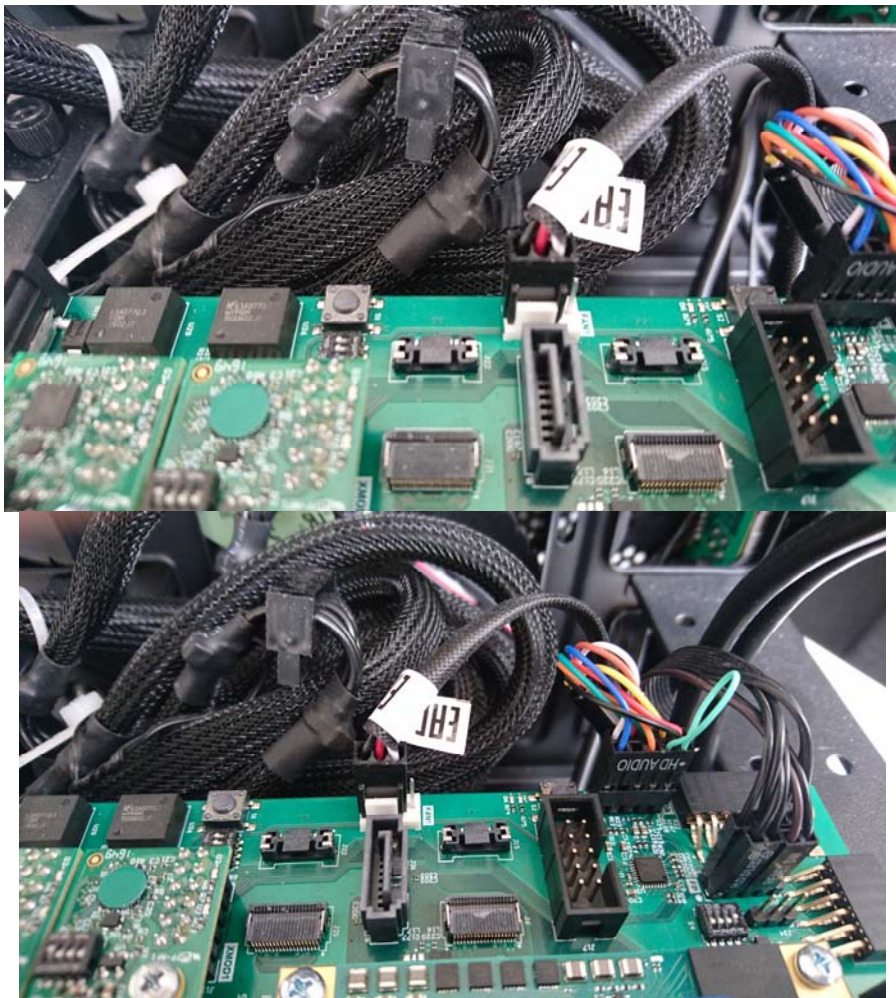
ATX Power

Module

FMC FAN

XMODs

Enclosure USB

Enclosure FAN1 and HDAUDIO

Enclosure Power Button , Reset Button, HDD LED and Power LED

Support

- For support, please go to http://forum.trenz-electronic.de/ or contact support@trenz-electronic.de