TEB0729 TRM

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Table of Contents

Overview 4
Key Features 4
Block Diagram 5
Main Components 6
Initial Delivery State 7
Signals, Interfaces and Pins 8
B2B Connector 8
VG96 Connector 8
HW-modification Concerning Reset-Signals 9
JTAG Interface 9
UART Interface 10
I²C Interface 10
SD IO Interface 10
USB2.0 Interface 11
Gigabit Ethernet Interface 11
10/100-BaseT Ethernet Interface 12
XMOD FTDI JTAG-Adapter Header 13
On-board Peripherals 14
Configuration EEPROM 14
4-bit DIP-switch 14
VCCIO Setting Jumper 15
RTC Buffer Voltage Supply Header 15
Push Button 15
On-board LEDs 15
Power and Power-On Sequence 16
Power Consumption 16
Power Distribution Dependencies 16
Power Rails 16
Board to Board Connectors 19
Variants Currently In Production 20
Technical Specifications 21
Absolute Maximum Ratings 21
Recommended Operating Conditions 21
Operating Temperature Ranges 21
Physical Dimensions 21
Revision History 23
Hardware Revision History 23
Document Change History 23
Disclaimer 24
Document Warranty 24
Limitation of Liability 24
Copyright Notice 24

Technology Licenses 24
Environmental Protection 24
REACH, RoHS and WEEE 25

Overview

Refer to https://wiki.trenz-electronic.de/display/PD/TEB0729+TRM for the current online version of this manual and other available documentation.The Trenz Electronic TEB0729 is a Carrier Board designed especially for the TE0729 Zynq-7000 SoM. The board exposes the module's B2B connector pins to accessible connectors and provides on-board peripheral components to test and evaluate TE Zynq-7000 SoMs and for developing purposes..

The Carrier Board provides soldering-pads for VG96 connectors as place-holders to get access to the PL-IO-banks and other functional units of the mounted SoM.

Key Features

- Barrel jack for 5V power supply
- 2x RJ45 10/100-BaseT Ethernet MagJack with 2 integrated LEDs
- 1x RJ45 Gigabit Ethernet MagJack with 2 integrated LEDs.
- 2x Configuration EEPROM's, connected to SoM's I²C interface
- XMOD compatible header to connect the TE0790 USB2.0 adapter board
- JTAG and UART interface over XMOD header
- MicroSD Card socket, can be used to boot system
- USB2.0 socket (Option: USB Type A or Micro USB2.0 B)
- 4-bit DIP switch for SoM configuration (SoM's JTAG access and Bootmode)
- VG96 connector soldering-pads J8 for access to SoM's PL-IO-bank-pins, usable as LVDS-pairs
- VG96 connector soldering-pads J9 for access to further interfaces and IO's of the SoM
- 1 x user LED (red) routed to SoM
- 1 x user push-button routed to SoM (Reset function at standard configuration)
- Pin headers to set PL-IO-bank's VCCIO with jumper

Additional assembly options are available for cost or performance optimization upon request.

Block Diagram

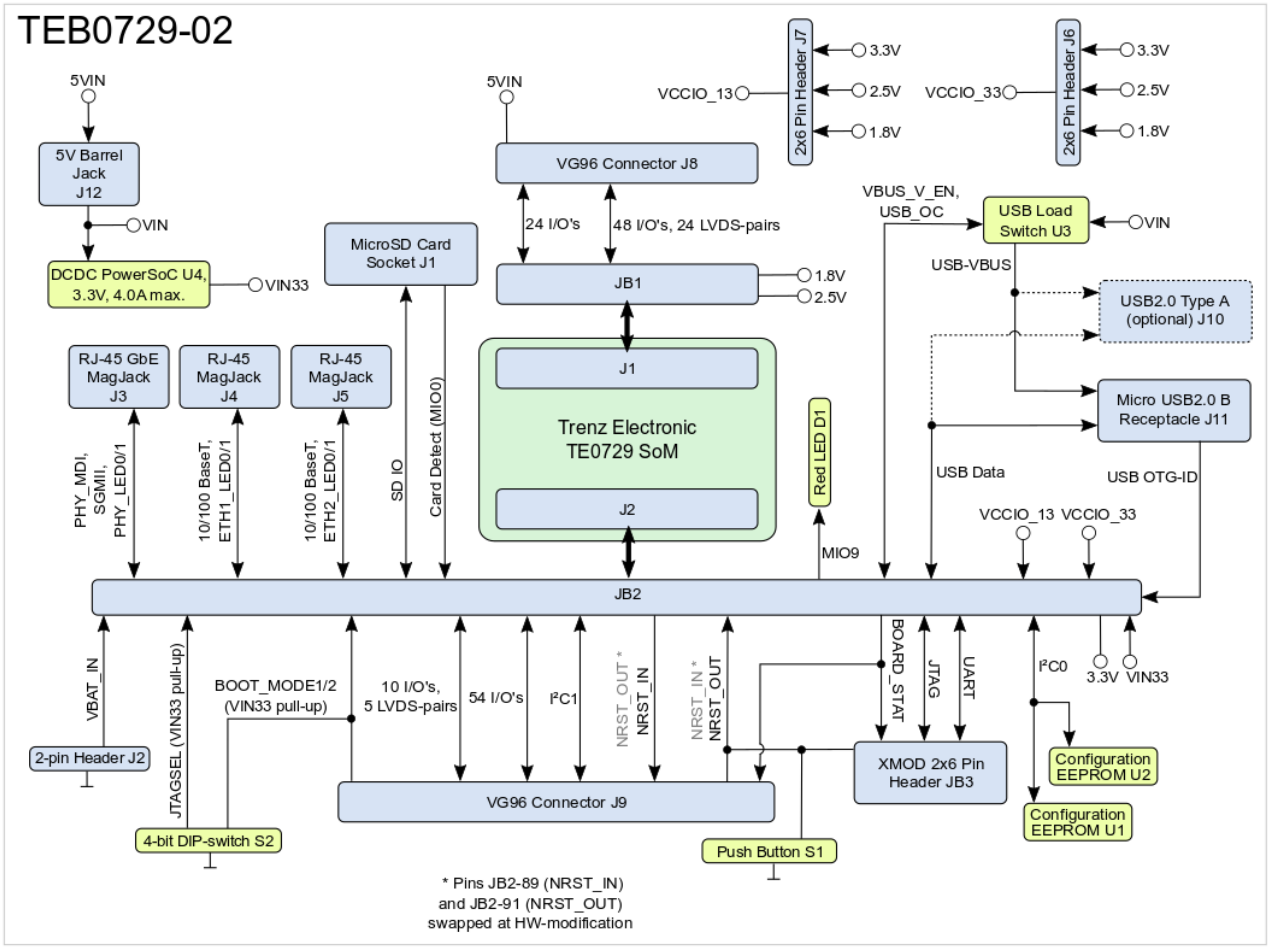
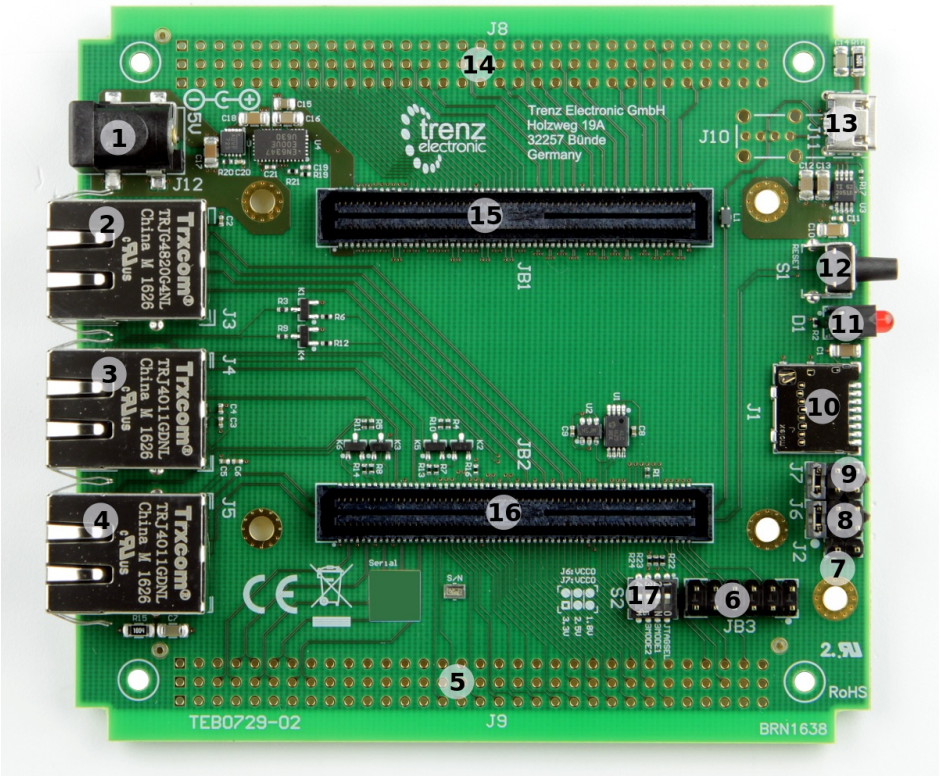


Figure 1: TEB0729-02 block diagram.

Main Components



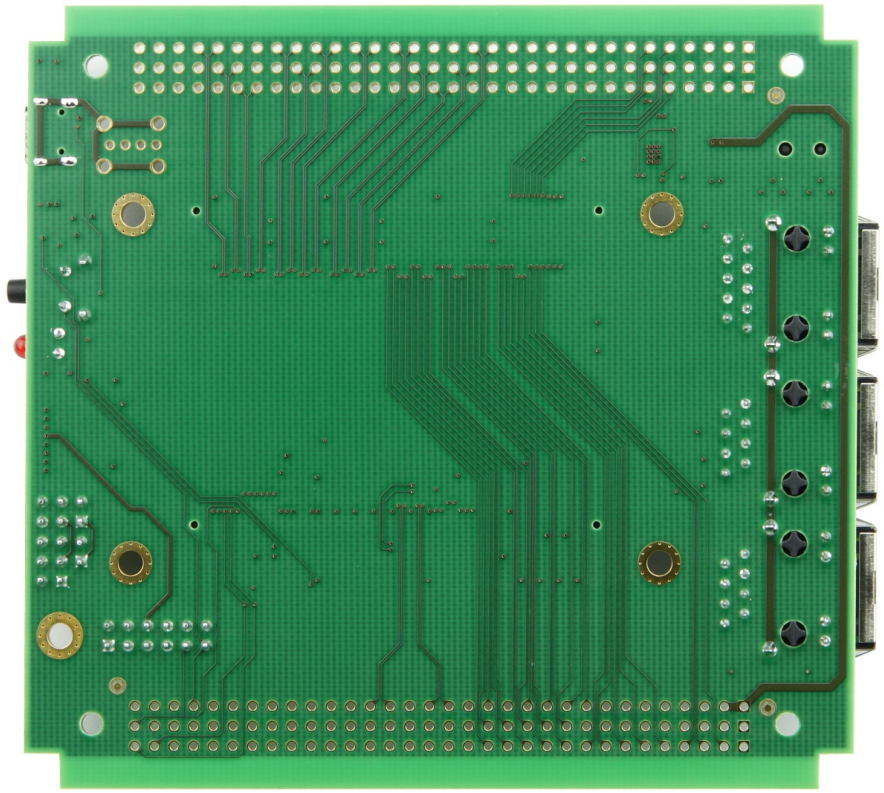


Figure 2: TEB0729-02 main components.

1. 5V barrel jack, J12
2. RJ-45 Gigabit Ethernet MegJack, J3
3. RJ-45 10/100-BaseT Ethernet MegJack, J4
4. RJ-45 10/100-BaseT Ethernet MegJack, J5
5. VG96 connector placeholder, J9
6. XMOD (TE0790) header, JB3
7. 2-pin header for VBAT-IN supply-voltage, J2
8. 2x6 pin header for setting VCCIO_33, J6
9. 2x6 pin header for setting VCCIO_13, J7
10. MicroSD Card socket, J1
11. Red LED, D1
12. Push Button, S1
13. Micro USB2.0 B Receptacle (optional USB2.0 Type A socket)
14. VG96 connector placeholder, J8
15. B2B Connector, JB1
16. B2B Connector, JB2
17. 4-bit DIP-switch, S2

Initial Delivery State

Storage device name	Content	Notes
Configuration EEPROM, U1	Empty	Not programmed
Configuration EEPROM, U2	Empty	Not programmed

Table 1: Initial delivery state of programmable devices on the module.

Signals, Interfaces and Pins

B2B Connector

The TEB0729 Carrier Board's Board-to-Board Connectors (B2B) have the same pin-assignment as the mounted Zynq SoM. By this connectors, the MIO- and PL-IO-bank's pins and further interfaces of the Zynq SoM can be accessed. A large quantity of these I/O's are also usable as LVDS-pairs. The connectors provide also VCCIO voltages to operate the I/O's properly.

Following table gives a summary of the available I/O's, interfaces and LVDS-pairs of the B2B connectors JB1 and JB2:

B2B Connector	Interfaces	Count of IO's	Notes
JB1	User IO	24 single ended	-
		48 single ended or 24 differential	-
JB2	User IO	54 single ended	-
		10 single ended or 5 differential	-
	I²C	2	-
	SD IO	7	-
	UART	2	-
	USB2.0	6	-
	2x 10/100-BaseT Ethernet	14	-
	GbE MDI and SGMII	14	-
	JTAG	4	-

Table 2: General overview of PL I/O signals and SoM's interfaces connected to the B2B connectors.

VG96 Connector

The TEB0729 Carrier Board has soldering pads provides as place-holders to mount VG96 connectors J8 and J9 to get access the PL-IO-bank's pins and further interfaces of the Zynq SoM. With mounted VG96 connectors, SoM's IO's are available to the user, a large quantity of these I/O's are also usable as LVDS-pairs.

On the VG96 connector J9 are signals assigned to control the SoM and the interfaces of the SoM's Zynq chip and of its on-module peripherals:

Following table gives a summary of the pin-assignment, available interfaces and functional IO's of the VG96 connectors J8 and J9:

VG96 Connector	Control Signals and Interfaces	Count of IO's	Notes
J8	User IO	24 single ended	-
		48 single ended or 24 differential	-
J9	User IO	54 single ended	-
		10 single ended or 5 differential	-
	'NRST_IN', 'NRST_OUT', pins J9-A29, J9-B30	2	SoM reset signals [1)]
	'BOARD_STAT', pins J9-B32	1	-
	'BOOT_MODE1', 'BOOT_MODE2', pins J9-C31, J9-C32	2	Binary bootmode code of SoM
	I²C, pins J9-A30, J9-A31	2	I²C1 interface of module
	GbE SGMII	4	SGMII interface of on-module GbE PHY

Table 3: General overview of PL I/O signals, SoM's interfaces and control signals connected to the VG96 connectors.

HW-modification Concerning Reset-Signals

[1)] The pins with the schematic net names 'NRST_IN' (JB2-89) and 'NRST_OUT' (JB2-91) are swapped as part of a HW-modification to rework the Reset-signals of the Carrier-Board in conjunction with the TE0729 SoM.

Refer to the SC CPLD documentation, section "Watchdog" to get further detailed information about the Reset-functionality of the Carrier Board and SoM before and after the HW-modification and the required SC CPLD firmware revision of the TE0729 SoM for each version of the SoM.

JTAG Interface

JTAG access to the mounted SoM is provided through B2B connector JB2 and is also routed to the XMOD header JB3. With the TE0790 XMOD USB2.0 to JTAG adapter, the Zynq chip on the mounted SoM can be programed via USB2.0 interface.

JTAG Signal	B2B Connector Pin	XMOD Header JB3	Note
TCK	JB2-119	JB3-4	-
TDI	JB2-115	JB3-10	-
TDO	JB2-117	JB3-8	-
TMS	JB2-113	JB3-12	-
JTAGSEL	JB2-111	-	Select SoM's JTAG programming mode on DIP-switch S2-1.

Table 4: JTAG interface signals.

UART Interface

UART interface is available on B2B connector JB2. With the TE0790 XMOD USB2.0 adapter, the UART signals can be converted to USB2.0 interface signals:

UART Signal Schematic Name	B2B	XMOD Header JB3	Note
USART0_RX	JB2-94	JB3-7	UART receive line
USART0_TX	JB2-96	JB3-3	UART transmit line

Table 5: UART interface signals.

I²C Interface

Two I²C interfaces are provided on B2B connector JB2. I²C0 interface is connected to the Configuration EEPROMs U1 and U2 and is dedicated to these on-board peripherals. Interface I²C1 is routed to the VG96 connector J9 and is available to the user for general purposes:

I²C Signal Schematic Name	B2B	Connected to	Note
I2C0_SDA	JB2-90	EEPROMs U1, U2	I²C data line
I2C0_SCL	JB2-92	EEPROMs U1, U2	I²C clock line
I2C1_SDA	JB2-93	J9-A30	I²C data line
I2C1_SCL	JB2-95	J9-A31	I²C clock line

Table 6: I²C interface signals.

SD IO Interface

The SD IO interface of the SoM's Zynq chip (MIO-bank) is routed to the on-board MicroSD Card socket J1. By this interface, the Zynq chip can be booted from an inserted MicroSD Card:

SD IO Signal Schematic Name	B2B	Connected to	Note
ESD_DAT0	JB2-108	J1-7	SD IO data
ESD_DAT1	JB2-110	J1-8	SD IO data
ESD_DAT2	JB2-100	J1-1	SD IO data
ESD_DAT3	JB2-102	J1-2	SD IO data
ESD_CLK	JB2-106	J1-5	SD IO clock
ESD_CMD	JB2-104	J1-3	SD IO command
MIO0	JB2-87	J1-9	Card Detect signal

Table 7: SD IO interface signals.

USB2.0 Interface

The TEB0729 Carrier Board is equipped with a Micro USB2.0 B (receptacle) socket J11 with board-revision TEB0729-02**B**, USB2.0 Type A socket is fitted on board-revision TEB0729-02**A**.

The differential data signals of the USB2.0 socket are routed to the B2B connector JB2, where they can be accessed by the USB2.0 transceiver of the mounted SoM. The USB2.0 connector can be used for Device mode, OTG Mode or Host Modes. For USB Host mode, the Carrier Board is additionally equipped with a power distribution switch U3 to provide the USB2.0 interface with the USB supply voltage USB-VBUS with nominal value of 5V. OTG mode is not available with USB2.0 Type A socket.

Following table gives an overview of the USB2.0 interface signals:

USB2.0 Signal Schematic Name	B2B	Connected to	Note
OTG-D_N	JB2-103	J11-2, (J10-2)	USB2.0 data
OTG-D_P	JB2-101	J11-3, (J10-3)	USB2.0 data
OTG-ID	JB2-109	J11-4	Ground this pin for A-Device (host), left floating this pin for B-Device (peripheral).
VBUS_V_EN	JB2-97	U3, pin 4	Enable USB-VBUS.
USB-VBUS	JB2-107	J11-1, (J10-1)	USB supply voltage in Host mode.
USB_OC	JB2-48, J9-B29	U3, pin 5	USB-VBUS over current signal: current-limit threshold exceeded by the connected USB device in USB Host mode.

Table 8: USB2.0 interface signals and connections.

Gigabit Ethernet Interface

The TEB0729 Carrier Board is fitted with one RJ-45 Gigabit Ethernet Magnetic jack J3. The MegJack has two integrated LEDs (both green), its signals are routed as MDI (Media Dependent Interface) to the B2B connector JB2, where they can be accessed by the GbE PHY transceiver of the mounted SoM:

GbE PHY Signal Schematic Name	B2B	Connected to	Notes
PHY_MDI0_P	JB2-84	J3-2	-
PHY_MDI0_N	JB2-82	J3-3	-
PHY_MDI1_P	JB2-78	J3-4	-
PHY_MDI1_N	JB2-76	J3-5	-
PHY_MDI2_P	JB2-72	J3-6	-
PHY_MDI2_N	JB2-70	J3-7	-
PHY_MDI3_P	JB2-66	J3-8	-
PHY_MDI3_N	JB2-64	J3-9	-

GbE PHY Signal Schematic Name	B2B	Connected to	Notes
PHY_LED0	JB2-59	Green MegJack J3 LED	-
PHY_LED1	JB2-57	Green MegJack J3 LED	-

Table 9: GbE interface signals and connections.

For the same GbE transceiver PHY on the mounted SoM, on the Carrier Board is also SGMII (Serial Gigabit Media Independent Interface) available. The SGMII pins are available on VG96 connector J9:

GbE PHY Signal Schematic Name	B2B	Connected to	Notes
SIN_P	JB2-52	J9-A16	-
SIN_N	JB2-54	J9-A17	-
SOUT_P	JB2-58	J9-A19	-
SOUT_N	JB2-60	J9-A20	-

Table 10: GbE SGMII signals and connections.

10/100-BaseT Ethernet Interface

The TEB0729 Carrier Board is also fitted with two additional RJ-45 MegJacks providing 10/100-BaseT Ethernet interfaces. This interfaces are routed to the B2B connector JB2

10/100-BaseT PHY Signal Schematic Name	B2B	Connected to	Notes
ETH1_RX_P	JB2-26	J4-3	-
ETH1_RX_N	JB2-28	J4-6	-
ETH1_TX_P	JB2-20	J4-1	-
ETH1_TX_N	JB2-22	J4-2	-
ETH1_CTREF	JB2-30	J4-4, J4-5	Centre Tap Reference point
ETH1_LED0	JB2-34	Yellow MegJack J4 LED	-
ETH1_LED1	JB2-32	Green MegJack J4 LED	-
ETH2_RX_P	JB2-8	J5-3	-
ETH2_RX_N	JB2-10	J5-6	-
ETH2_TX_P	JB2-2	J5-1	-
ETH2_TX_N	JB2-4	J5-2	-
ETH2_CTREF	JB2-18	J5-4, J5-5	Centre Tap Reference point
ETH2_LED0	JB2-16	Yellow MegJack J5 LED	-
ETH2_LED1	JB2-14	Green MegJack J5 LED	-

Table 11: 10/100-BaseT Ethernet interfaces signals and connections.

XMOD FTDI JTAG-Adapter Header

The JTAG interface of the mounted SoM can be accessed via header JB3, which has a 'XMOD FTDI JTAG Adapter'-compatible pin-assignment. So in use with the XMOD-FT2232H adapter-board TE0790 the mounted SoM can be programmed via USB interface. The TE0790 board provides also an UART interface to the Zynq SoM which can be accessed by the USB2.0 interface of the adapter-board while the signals between these serial interfaces will be converted. The adapter-board offers also two GPIO's, one with an indication LED (pin JB3-9 (E)) and another one with a low-active push button (pin JB3-11 (G)).

Following table describes the signals and interfaces of the XMOD header JB3:

JB3 pin	Signal Schematic Net Name	B2B	Note
C (pin 4)	TCK	JB2-119	-
D (pin 8)	TDO	JB2-117	-
F (pin 10)	TDI	JB2-115	-
H (pin 12)	TMS	JB2-113	-
A (pin 3)	USART0_TX	JB2-96	-
B (pin 7)	USART0_RX	JB2-94	-
E (pin 9)	BOARD_STAT	JB2-112	also connected to VG96 connector pin J9-B32
G (pin 11)	NRST_IN [2)]	JB2-89	also connected to VG96 connector pin J9-A29

Table 12: XMOD header signals and connections. [2)] Swapped at HW-Modification with signal 'NRST_OUT' in board-revision 2

When using XMOD FTDI JTAG Adapter TE0790, the adapter-board's VCC and VCCIO will be sourced by the Carrier Board. Set the DIP-switch with the setting:

XMOD DIP-switches	Position
Switch 1	ON
Switch 2	OFF
Switch 3	OFF
Switch 4	ON

Table 13: XMOD adapter board DIP-switch positions for voltage configuration .

⚠ Use Xilinx compatible TE0790 adapter board (designation TE-0790-xx with out 'L') to program the Zynq device.

The TE0790 adapter board's CPLD have to be configured with the **Standard** variant of the firmware. Refer to the TE0790 Resources Site for further information and firmware download.

On-board Peripherals

Configuration EEPROM

The TEB0729 Carrier Board is equipped with two Configuration EEPROMs U1 and U2 from Microchip.

- U1: Microchip 24LC128: 128 KBit memory density (8 pages a 16 KBit), 400 KHz max. clock frequency
  - I²C-Address: 1010 101
- U2: Microchip 24AA025E48T: 2 KBit memory density (2 block of 128 x 8-bit words), 400 KHz max. clock frequency
  - I²C-Address: 1010 011

The Configuration EEPROMs are connected to the I²C0 interface of the Zynq's MIO-bank via B2B connector JB2.

4-bit DIP-switch

Table below describes DIP-switch S2 settings for configuration of the mounted SoM:

DIP-switches S2	Signal Schematic Net Name	Function	Note
S2-1	JTAGSEL	Select Zynq chip or SC CPLD programming of mounted SoM: OFF: Zynq device in JTAG chain ON: CPLD in JTAG chain	Refer also to the TE0729 SC CPLD documentation for detailed information about JTAG update
S2-2	BOOT_MODE1	Select first bit of boot mode code	Refer to TE0729 TRM and SC CPLD documentation for detailed information about boot modes
S2-3	BOOT_MODE2	Select second bit boot mode code	
S2-4	x	x	not used

Table 14: DIP-Switch S2 SoM configuration settings

Boot Mode	S2-2	S2-3
JTAG	ON	ON
SD	OFF	OFF
QSPI	ON	OFF

Table 15: Boot Modes configuration via DIP-switch S2 with default TE0729 CPLD Firmware

VCCIO Setting Jumper

The Carrier Board VCCIO for the PL IO-banks of the mounted SoM are selectable by the jumpers J6 and J7.

Following table describes how to configure the VCCIO of the SoM's banks with jumpers:

VCCIO vs. Voltage Levels	VCCIO_13	VCCIO_33	Note
1.8V	J7: pins **1-2**	J6: pins **1-2**	-
2.5V	J7: pins **3-4**	J6: pins **3-4**	-
3.3V	J7: pins **5-6**	J6: pins **5-6**	-

Table 16: VCCIO jumper settings.

RTC Buffer Voltage Supply Header

The buffer voltage of the SoM's RTC can be supplied through the header J2. Refer to the SoM's TRM for recommended voltage range and absolute maximum ratings.

Push Button

The Carrier Board's push button S1 is connected to the 'NRST_IN' signal, the function of the button is to trigger a reset of the mounted SoM by driving the reset-signal 'NRST_IN' to ground.

On-board LEDs

LED	Color	Connected to	Description and Notes
D1	Red	'MIO9', pin JB2- 88	user LED

Table 17: On-board LEDs.

Power and Power-On Sequence

Power Consumption

The maximum power consumption of the Carrier Board depends mainly on the mounted SoM's FPGA design running on the Zynq chip.

Xilinx provide a power estimator excel sheets to calculate power consumption. It's also possible to evaluate the power consumption of the developed design with Vivado. See also Trenz Electronic Wiki FAQ.

Power Input	Typical Current
5VIN	TBD*

Table 18: Typical power consumption.

* TBD - To Be Determined soon with reference design setup.

Power supply with minimum current capability of 3A for system startup is recommended.

To avoid any damage to the module, check for stabilized on-board voltages and VCCIO's before put voltages on PL I/O-banks and interfaces. All I/Os should be tri-stated during power-on sequence.

Power Distribution Dependencies

The Carrier Board needs one single power supply voltage with a nominal value of 5V. Following diagram shows the distribution of the input voltage '5VIN' to the on-board components on the mounted SoM:

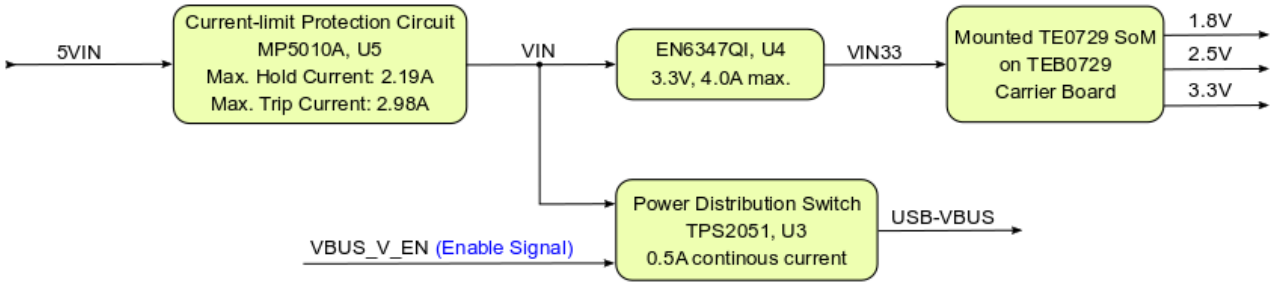


Figure 3: Board power distribution diagram.

Power Rails

Module Connector (B2B) Designator	VCC / VCCIO	Direction	Pins	Notes
JB1	VIN33	Out	1, 2, 3, 4, 5, 6	3.3V module supply voltage
	VCCIO_13	Out	101, 102	PL IO-bank VCCIO

Module Connector (B2B) Designator	VCC / VCCIO	Direction	Pins	Notes
	VCCIO_33	Out	29, 30	PL IO-bank VCCIO
	3.3V	In	65, 66	voltage output from module
JB2	1.8V	In	49	voltage output from module
	2.5V	In	13	voltage output from module
	USB-VBUS	Out	107	USB Host supply voltage
	VBAT_IN	Out	118	RTC buffer voltage

Table 19: Power pin description of B2B Module Connector.

Jumper / Header Designator	VCC / VCCIO	Direction	Pins	Notes
J6	VCCIO_33	Out	2, 4, 6	-
	1.8V	In	5	-
	2.5V	In	3	-
	3.3V	In	1	-
J7	VCCIO_13	Out	2, 4, 6	-
	1.8V	In	5	-
	2.5V	In	3	-
	3.3V	In	1	-

Table 20: Power Pin description of VCCIO selection jumper pin header.

Main Power Jack and Pins Designator	VCC / VCCIO	Direction	Pins	Notes
J12	5VIN	In	-	-
J9	5VIN	In	A1, A2	'5VIN' power supply to the Carrier Board as alternative to J12
J2	VBAT_IN	In	1	**Attention**: Pin 2 connected to ground. VBAT_IN voltage on this pin cause short-circuit.

Table 21: Main Power jack and pins description.

Peripheral Socket Designator	VCC / VCCIO	Direction	Pins	Notes
J10 / J11	USB-VBUS	Out	1	USB2.0 Type A socket / Micro USB2.0 B socket
J1	VIN33	Out	4	MikroSD Card socket VDD

Table 22: Power pin description of peripheral connector.

XMOD Header Designator	VCC / VCCIO	Direction	Pins	Notes
JB3	3.3V	-	5	not connected

XMOD Header Designator	VCC / VCCIO	Direction	Pins	Notes
	VIO	Out	6	connected to VIN33

Table 23: Power pin description of XMOD/JTAG Connector.

Board to Board Connectors

The TE0729 module has two 120-pin double-row REF-189019-02 connectors on the bottom side which are compatible with Samtec BSE-060-01-L-D-A connectors. Mating connectors on the baseboard are REF-189019-01, which are compatible with Samtec BTE-060-01-L-D-A connectors.

Order number	REF Number	Samtec Number	Type	Mated Height	Data sheet	Comment
-	REF-189019-02	BTE-060-01-L-D-A-K-TR	Module connector	5 mm	http://suddendocs.samtec.com/catalog_english/bte.pdf	Standard connector used on module
26663	REF-189019-01	BSE-060-01-L-D-A-TR	Baseboard connector	5 mm	http://suddendocs.samtec.com/catalog_english/bse.pdf	Standard connector used on board

Table 24: B2B Connectors.

Variants Currently In Production

Module Variant	Operating Temperature	USB Socket	Temperature Range
TEB0729-02-A	-40°C to +125°C	USB2.0 Type A socket fitted	Industrial
TEB0729-02-B	-40°C to +125°C	Micro USB2.0 B socket fitted	Industrial

Table 25: Module variants.

Technical Specifications

Absolute Maximum Ratings

Parameter	Min	Max	Units	Reference Document
5VIN supply voltage	-0.3	7	V	MP5010A, EN6347QI data sheet
Storage temperature	-65	150	°C	-

Table 26: Module absolute maximum ratings.

Recommended Operating Conditions

Parameter	Min	Max	Units	Reference Document
5VIN supply voltage	4.75	5.25	V	USB2.0 specification concerning 'VBUS' voltage
Operating temperature	-40	125	°C	-

Table 27: Module recommended operating conditions.

Operating Temperature Ranges

Industrial grade: -40°C to +85°C.

The TEB0729 Carrier Board itself is capable to be operated at industrial grade temperature range.

Please check the operating temperature range of the mounted SoM, which determine the relevant operating temperature range of the overall system.

Physical Dimensions

- Board size: 107.70 mm × 100 mm. Please download the assembly diagram for exact numbers.
- Mating height with standard connectors: 8 mm.
- PCB thickness: ca. 1.65mm.
- Highest part on the PCB is the Ethernet RJ-45 jack, which has an approximately 17 mm overall height. Please download the step model for exact numbers.

All dimensions are given in millimeters.

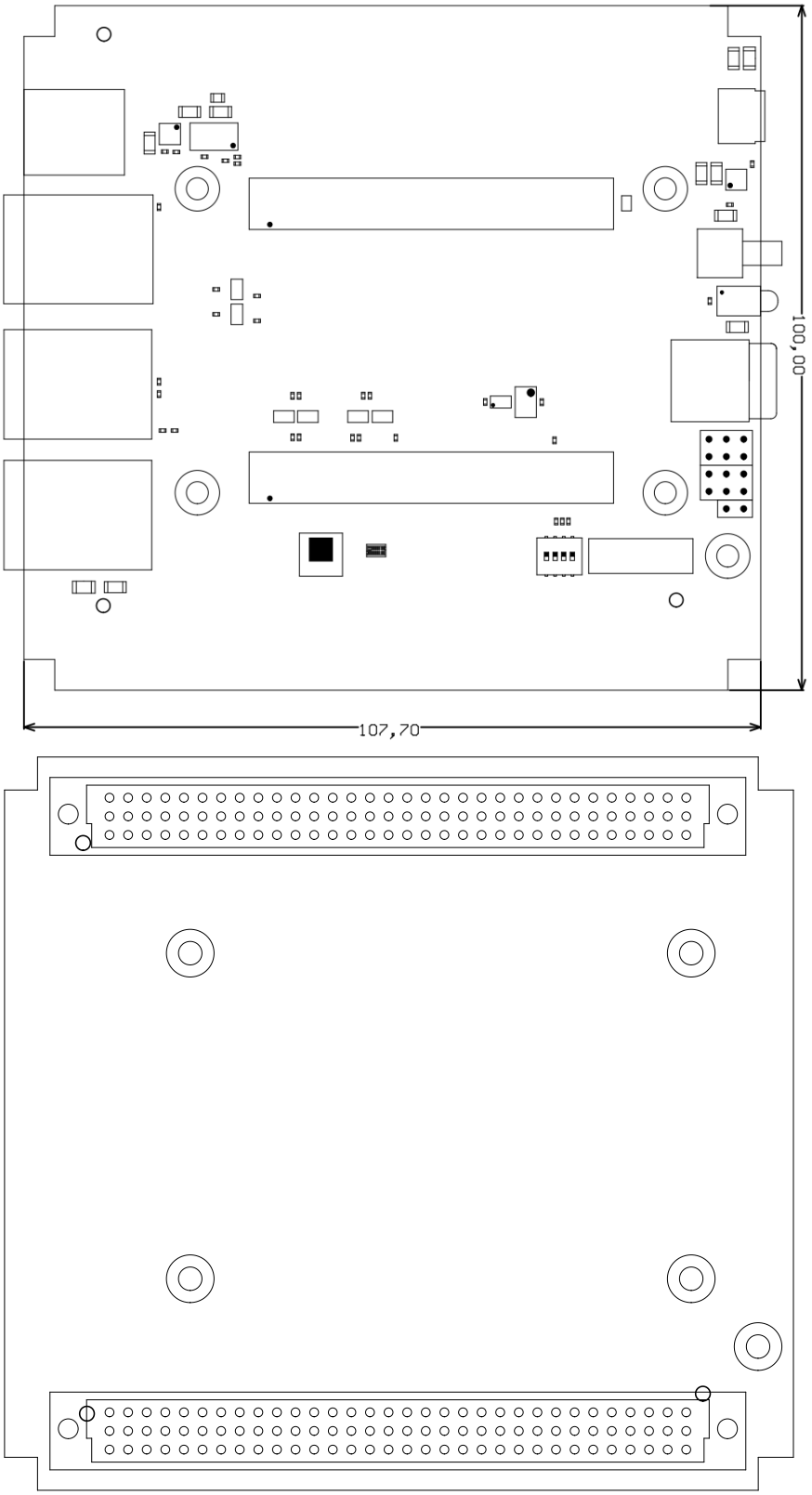


Figure 4: Board physical dimensions drawing.

Revision History

Hardware Revision History

Date	Revision	Notes	PCN	Documentation Link
-	01	• First Production Release	-	TEB0729-01
-	02	• Second Production Release • HW-Modification since 22.08.2017 • Refer to Changes list in Schematic	-	TEB0729-02

Table 28: Module hardware revision history.

Hardware revision number can be found on the PCB board together with the module model number separated by the dash.

Figure 5: Module hardware revision number.

Document Change History

Date	Revision	Contributors	Description
2017-11-02	v.17	Ali Naseri	• initial document

Table 29: Document change history.

Disclaimer

Document Warranty

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Environmental Protection

To confront directly with the responsibility toward the environment, the global community and eventually also oneself. Such a resolution should be integral part not only of everybody's life. Also enterprises shall be conscious of their social responsibility and contribute to the preservation of our common living space. That is why Trenz Electronic invests in the protection of our Environment.

REACH, RoHS and WEEE

REACH

Trenz Electronic is a manufacturer and a distributor of electronic products. It is therefore a so called downstream user in the sense of REACH. The products we supply to you are solely non-chemical products (goods). Moreover and under normal and reasonably foreseeable circumstances of application, the goods supplied to you shall not release any substance. For that, Trenz Electronic is obliged to neither register nor to provide safety data sheet. According to present knowledge and to best of our knowledge, no SVHC (Substances of Very High Concern) on the Candidate List are contained in our products. Furthermore, we will immediately and unsolicited inform our customers in compliance with REACH - Article 33 if any substance present in our goods (above a concentration of 0,1 % weight by weight) will be classified as SVHC by the European Chemicals Agency (ECHA).

RoHS

Trenz Electronic GmbH herewith declares that all its products are developed, manufactured and distributed RoHS compliant.

WEEE

Information for users within the European Union in accordance with Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE).

Users of electrical and electronic equipment in private households are required not to dispose of waste electrical and electronic equipment as unsorted municipal waste and to collect such waste electrical and electronic equipment separately. By the 13 August 2005, Member States shall have ensured that systems are set up allowing final holders and distributors to return waste electrical and electronic equipment at least free of charge. Member States shall ensure the availability and accessibility of the necessary collection facilities. Separate collection is the precondition to ensure specific treatment and recycling of waste electrical and electronic equipment and is necessary to achieve the chosen level of protection of human health and the environment in the European Union. Consumers have to actively contribute to the success of such collection and the return of waste electrical and electronic equipment. Presence of hazardous substances in electrical and electronic equipment results in potential effects on the environment and human health. The symbol consisting of the crossed-out wheeled bin indicates separate collection for waste electrical and electronic equipment.

Trenz Electronic is registered under WEEE-Reg.-Nr. DE97922676.
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