TEB0835 TRM

Revision v.56

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Online version of this document:

https://wiki.trenz-electronic.de/display/PD/TEB0835+TRM

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4 Overview

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The Trenz Electronic TEB0835 is a carrier for TE0835 module which is based on Xilinx UltraScale+ RFSoC. The Carrier is equipped with a Micro SD card reader, Micro USB2.0, 21x UMCC connectors and 6x SMA connectors for clocks and ADC/DAC inputs/outputs , 6x Green User LEDs, Reset Push Button, DIP Switch for Mode, Battery Holder, FT2232H FTDI, programmable clock generators and a Temperature sensor IC. The carrier provides PCIe connector as well.

Refer to http://trenz.org/teb0835-info for the current online version of this manual and other available documentation.

4.1 Key Features

- **Modules:**
  - TE0835
- **RAM/Storage**
  - 4Kb EEPROM
- **On Board**
  - Programmable Clock Generator
  - I^2C Switch IC
  - 6x User Green LEDs
  - 16x RF Transformation
  - Reset Push Button
  - Temperature Sensor
  - FT2232H FTDI
  - SDIO Port Expander
  - 2x DIP Switch
  - Pin Headers
  - PCIe 6 Connector
- **Interface**
  - 21x UMCC Connectors
  - 6x SMA Connectors
  - 2x Micro USB2.0
  - RJ45 LAN Socket
  - Micro SD Card Socket
  - 2x UEC5 Connectors
  - 2x UCC8 Connectors
  - PCIe x8 Card
  - 2x Samtec Razor Beam SS5 (2x80 pol) Board to Board Connectors
- **Power**
  - 12V Input Supply Voltage
- **Dimension**
  - 106.6 x 167.6 mm

4.2 Block Diagram

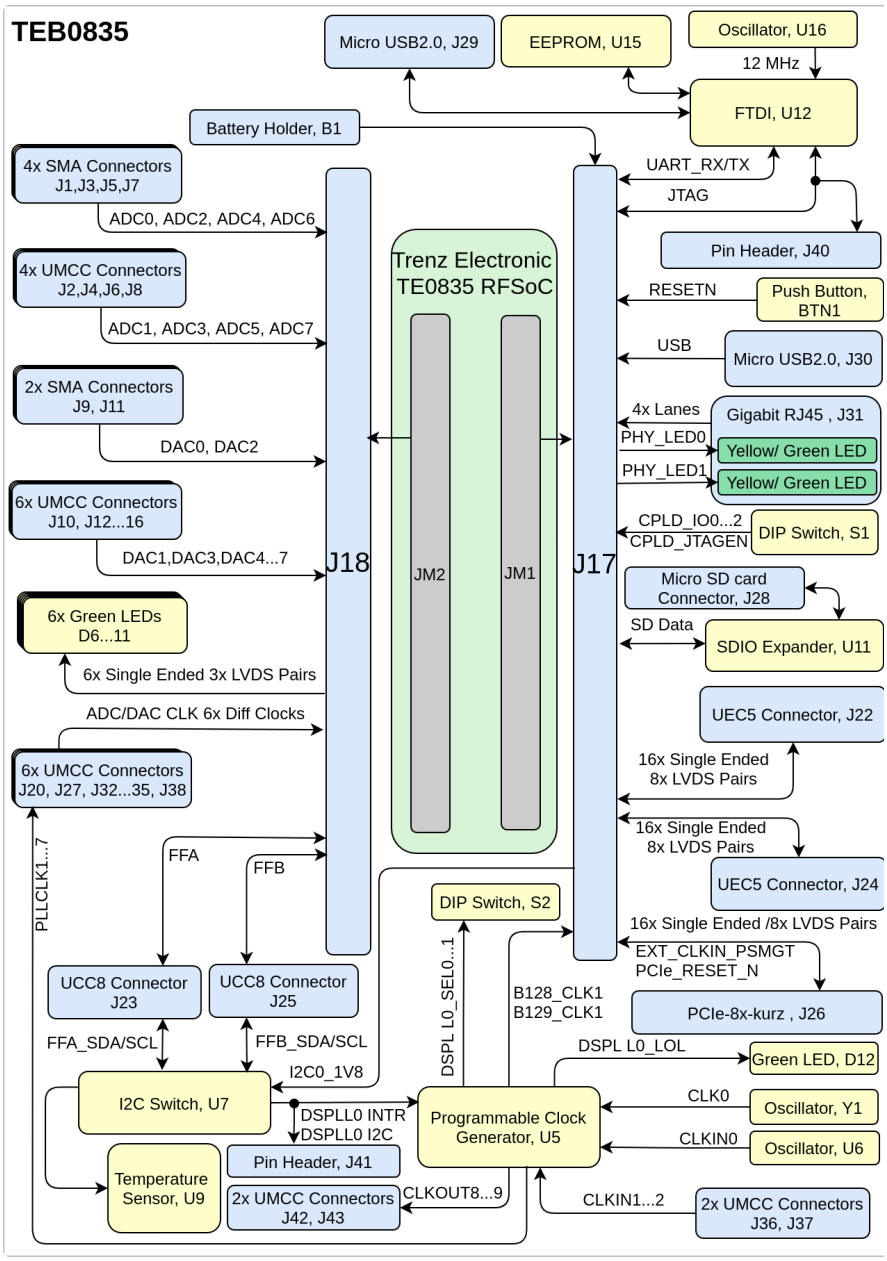

Figure 1: TEB0835 block diagram

4.3 Main Components

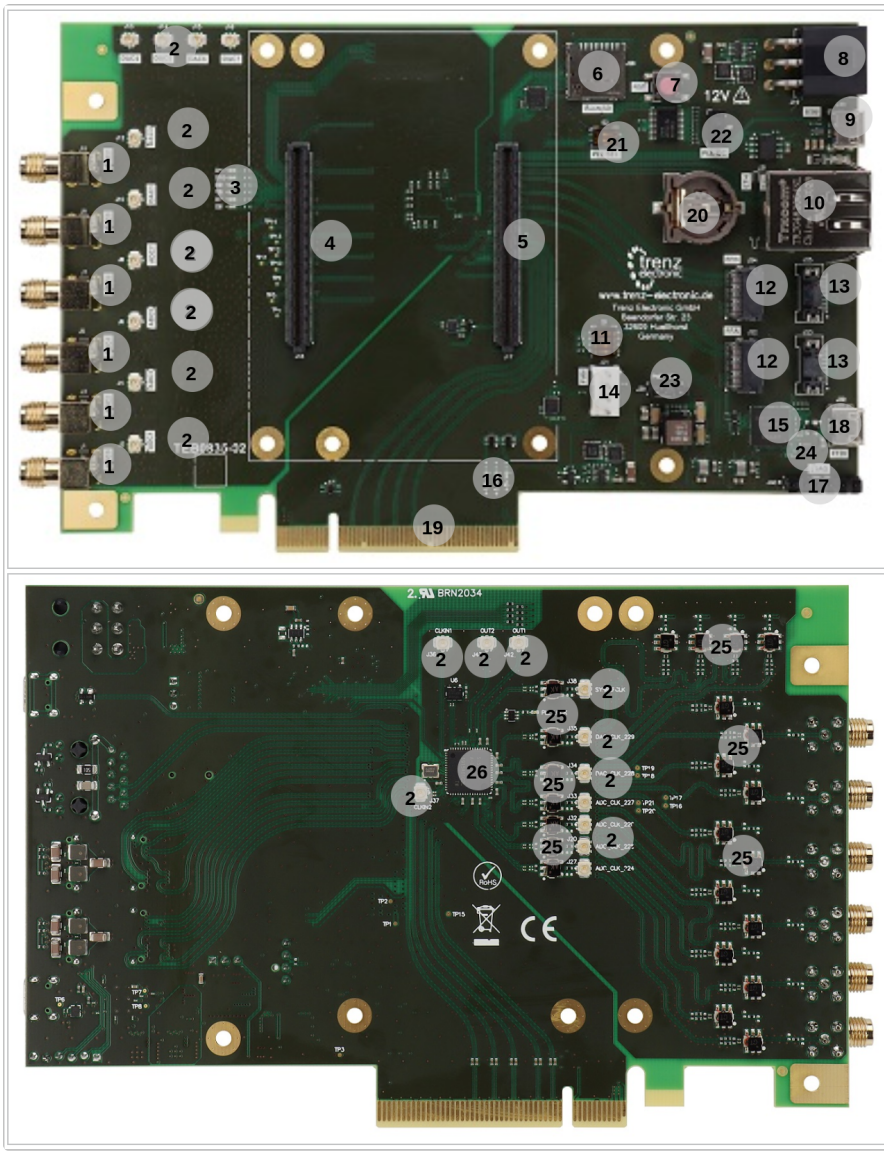

Figure 2: TEB0835 main components

1. SMA Connectors, J1,J3,J5,J7,J9,J11
2. UMCC Connectors, J2,J4,J6,J8, J10, J12...16, J20, J27, J32...J38, J42...43
3. Green LEDs, D6...11
4. B2B Connector, J18
5. B2B Connector, J17
6. Micro SD Card Connector, J28
7. Reset Push Button, BTN1
8. PCIe 6 Pin Connector, J19
9. Micro USB2.0 Connectors, J30
10. Gigabit RJ45 Connector, J31
11. DIP Switch, S1
12. UEC5 Connector, J22,J24
13. UCC8 Connector, J23,J25
14. 1x4 Pin Header, J21
15. FTDI, U12

16. Green LEDs, D1...3
17. 1x6 Pin Header, J40
18. Micro USB2.0 Connectors (FTDI), J29
19. PCIe-8x-kurz Card, J26
20. Battery Holder, B1
21. DIP Switch (PLL SEL), S2
22. Pin Header (PLL I2C), J41
23. Jumper (PWR CFG), J39
24. EEPROM, U15
25. RF Transformer, T2...17, T26...32
26. Programmable Clock Generator, U5

4.4 Initial Delivery State

Storage device name	Content	Notes
EEPROM	Programmed	FTDI Configuration

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

4.5 Configuration Signals

Push Button BTN1 is provided to switch OFF all power supplies on RFSoC board.

Signal	B2B	I/O	Note
RESETN	J17- 36	Input	Connected to Push Button, BTN1

Table 2: Reset process.
There is a DIP switch S1 provided for enabling CPLD and set the FPGA boot mode. The DIP Switch setting should be set like the following table.

DIP	Signal	Setting	Note
S1-A	CPLD_IO0	FPGA boot config	Bit 0, CPLD Firmware dependent.
S1-B	CPLD_IO1	FPGA boot config	SDA pin
S1-C	CPLD_IO2	-	PROGRAMN pin

DIP	Signal	Setting	Note
S1-D	CPLD_JTAGEN	CPLD JTAG EN	JTAGENB

Table 3: CPLD Configuration

Boot Mode must be set using DIP Switch S1 on CPLD provided on the module TE0835. Please note that the DIP Switch is active low.

MODE Signal State	Boot Mode	
	S1-A	S1-B
JTAG	ON	ON
QSPI Flash	ON	OFF
SD Card	OFF	OFF

Table 4: Boot process.

5 Signals, Interfaces and Pins

5.1 Board to Board (B2B) I/Os

Number of I/O signals and interfaces connected to the B2B connectors:

B2B Connector	Interface	I/O Signal Count	Connected to	Notes
J17	I2C	3x Single Ended	I2C Switch, U7	
	PLL Intrupt PLL Clocks	1x Single Ended 4x Single Ended, 2x Differential pairs	PLL Clock Generator, U5	
	JTAG	4x Single Ended	FTDI, U12	
	CPLD IO CPLD Enable	3x Single Ended 1x Single Ended	DIP Switch, S1	
	PCIe Reset	1x Single Ended	PCIe Card, J26	
	UART	2x Single Ended	FTDI, U12	
	Ethernet LED Ethernet MDI	2x Single Ended 8x Single Ended	RJ45 Connector, J31	
	SD Card	6x Single Ended	Micro SD Memory	

B2B Connector	Interface	I/O Signal Count	Connected to	Notes
			Connector, J28 IO Expander, U11	
	I/O	16x Single Ended, 8x Differential pairs	PCIe Card, J26	PCIe
	I/O	16x Single Ended, 8x Differential pairs	UEC5 Connector, J22	UEC5
	I/O	16x Single Ended, 8x Differential pairs	UEC5 Connector, J24	UEC5
	Micro USB2.0	2x Single Ended 1x Single Ended 2x Single Ended	Micro USB2.0 Connector, J30 Voltage Regulator, U17 Diode, D5	
J18	ADC	16x Single Ended, 8x Differential pairs	SMA, J1, J3, J5, J7 UMCC, J2, J4, J6, J8	
	ADC Clock	4x Single Ended,	UMCC, J27, J32	

B2B Connector	Interface	I/O Signal Count	Connected to	Notes
		2x Differential pairs		
	DAC	16x Single Ended, 8x Differential pairs	SMA, J9, J11 UMCC, J10, J12, J13...16	
	DAC Clock	4x Single Ended, 2x Differential pairs	UMCC, J33, J34	
	Green LEDs	6x Single Ended, 3x Differential pairs	Green LEDs, D6...11	
	I/O	10x Single Ended	UCC8 Connector, J23, J25	UCC8

Table 5: B2B connections information

5.2 Gigabit Ethernet

Signal Name	Connected to	Signal Description	Note
PHY_MDI0...3	B2B, J17	Media Data	
PHY_LED0...1	B2B, J17	Speed/Link Indicators LED	Yellow/Green

Table 6: Gigabit Ethernet information

5.3 Micro USB for JTAG/UART

The TEB0835 is equipped with two Micro USB2.0 Connectors J29, J30. The Micro USB2.0 port, J29 is provided for JTAG/UART and it is connected to FTDI, U12.

Designator	Signal Name	Connected to	Note
J29	D_N/D_P	FTDI,U12	Data
	USB_VBUS	Diode, D4	VBUS

Table 7: Micro USB2 to JTAG/UART connections

5.4 Micro USB2.0

There is a Micro USB2.0 J30, provided for user.

Designator	Signal Name	Connected to	Note
J30	USB_N/ USB_P	B2B, J17	Data
	USB0_VBUS	B2B, J17	VBUS
	USB0_ID	B2B, J17	ID

Table 8: Micro USB2.0 Socket connections

5.5 Micro SD Card Reader

There is a Micro SD Card socket J28 connected to B2B J17 through an I/O expander U11.

Pin	Signal Name	Connected to	Note
VDD	3.3V_SD	B2B, J17	connected to IO expander
CMD	SD_CMD	B2B, J17	connected to IO expander

Pin	Signal Name	Connected to	Note
CLK	SD_CLK	B2B, J17	connected to IO expander
DATA0...3	SD_DATA0...3	B2B, J17	connected to IO expander
CD	SD_CD	B2B, J17	

Table 9: Micro SD Card Socket connections

5.6 SMA Connectors

There are 6 SMA Connectors provided for Analog and Digital signals.

Designator	Signal Name	Connected to	Note
J1	ADC0_IN	B2B, J18	Via RF Transformer T2
J3	ADC2_IN	B2B, J18	Via RF Transformer T6
J5	ADC4_IN	B2B, J18	Via RF Transformer T4
J7	ADC6_IN	B2B, J18	Via RF Transformer T8
J9	DAC0_OUT	B2B, J18	Via RF Transformer T10
J11	DAC2_OUT	B2B, J18	Via RF Transformer T12

Table 10: SMA Connectors information

5.7 UMCC Connectors

There are 21x UMCC Connectors provided for Analog /Digital signals and Clocks input and output.

Designator	Signal Name	Connected to	Note
J2	ADC1_IN	B2B, J18	Via RF Transformer T3
J4	ADC3_IN	B2B, J18	Via RF Transformer T5
J6	ADC5_IN	B2B, J18	Via RF Transformer T7
J8	ADC7_IN	B2B, J18	Via RF Transformer T9
J10	DAC1_OUT	B2B, J18	Via RF Transformer T11
J12	DAC3_OUT	B2B, J18	Via RF Transformer T13
J13	DAC4_OUT	B2B, J18	Via RF Transformer T14
J14	DAC5_OUT	B2B, J18	Via RF Transformer T15
J15	DAC6_OUT	B2B, J18	Via RF Transformer T16
J16	DAC7_OUT	B2B, J18	Via RF Transformer T17
J27	ADC_CLK_224	B2B, J18	Via RF Transformer T26

Designator	Signal Name	Connected to	Note
J20	ADC_CLK_225	B2B, J18	Via RF Transformer T27
J32	ADC_CLK_226	B2B, J18	Via RF Transformer T28
J33	ADC_CLK_227	B2B, J18	Via RF Transformer T29
J34	DAC_CLK_228	B2B, J18	Via RF Transformer T30
J35	DAC_CLK_229	B2B, J18	Via RF Transformer T31
J36	CLKIN1	Programmable Clock Generator, U5	
J37	CLKIN2	Programmable Clock Generator, U5	
J38	CLKOUT7	Programmable Clock Generator, U5	Via RF Transformer T32
J42	CLKOUT8	Programmable Clock Generator, U5	
J43	CLKOUT9	Programmable Clock Generator, U5	

Table 11: UMCC Connectors

5.8 UCE5 Connectors

The TEB0835 is equipped with two UCE5 Connectors.

Designator	Signal Name	Connected to	Note
J22	B128_TX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs
	B128_RX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs
J24	B129_TX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs
	B129_RX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs

Table 12: UEC5 Connectors

5.9 UCC8 Connectors

The TEB0835 is equipped with two UCC8 Connectors.

Designator	Signal Name	Connected to	Note
J23	FFA_MPRS	B2B, J17	
	FFA_MSEL	B2B, J17	
	FFA_INTL	B2B, J17	
	FFA_RSTL	B2B, J17	
	FFA_SCL/ FFA_SDA	I2C Switch, U7	
J25	FFB_MPRS	B2B, J17	
	FFB_MSEL	B2B, J17	

Designator	Signal Name	Connected to	Note
	FFB_INTL	B2B, J17	
	FFB_RSTL	B2B, J17	
	FFB_SCL/ FFB_SDA	I2C Switch, U7	

Table 13: UCC8 Connectors

5.10 PCIe 8x Short

There is a PICe-8x-Short card provided on the TEB0835 board.

Signal Name	Connected to	Note
B505_RX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs
B505_TX0...3	B2B, J17	8x Single Ended/ 4x LVDS Pairs
EXT_CLKIN_PSMGT	B2B, J17	
PCIE_RSTB_R	B2B, J17	Pulled up to 1.8V

Table 14: PCIe x8 Kurz Connections

5.11 PCIe 6 Pins

Pin	Signal Name	Connected to	Note
1	12V_input_A	Regulator, U2	
2			
3			

Pin	Signal Name	Connected to	Note
4	GND	N.C	
5			
6			

Table 15: PCIe 1x6 Connection

5.12 Pin Header 1x4

Pin	Signal Name	Connected to	Note
1	GND	GND	
2	FAN_PWR	12V	
3	FAN_TACH	Tepmerature Sensor, U9	
4	FAN_PWM	Tepmerature Sensor, U9	

Table 16: Pin Header1x4 Connections

5.13 Pin Header 1x6

There is a 1x6 Pin Header J40, connected to JTAG signals as the following.

Pin	Signal Name	Connected to	Note
1	JTAG_TMS	B2B, J17 FTDI, U12	
2	JTAG_TDI	B2B, J17 FTDI, U12	
3	JTAG_TDO	B2B, J17 FTDI, U12	

Pin	Signal Name	Connected to	Note
4	JTAG_TCK	B2B, J17 FTDI, U12	
5	GND	-	
6	3.3V_MODULE	B2B, J17	

Table 17: Pin Header1x6 Connections

5.14 Pin Header 1x3

There is a 1x3 Pin Header J41, it provides access to I2C signals which are connected to I2C Switch, U7.

Pin	Signal Name	Connected to	Note
1	DSPLL0_SCL	I2C Switch, U7	
2	GND	I2C Switch, U7	
3	DSPLL0_SCL	I2C Switch, U7	

Table 18: Pin Header 1x3 Connectors

5.15 Jumper

There is a Jumper J39 provided for setting the DCDC_EN between two signal level as the following.

Pin	Signal Name	Connected to	Note
1	PG_5V	Regulator, U8	
2	DCDC_EN	Regulator, U1, U4	
3	MODULE_PG	B2B, J17	

Table 19: Jumper Connections

5.16 I2C Addresses

Designator	I2C Address	Notes
U9	0x4C	Temperature Sensor IC
U7	0x70	I2C Switch
U5	0x68	Programmable Clock Generator

Table 20: I2C addresses table

5.17 Test Points

Test Point	Signal	Connected to	Notes
TP1	5V	B2B, J17	
TP2...3	GND	GND	
TP4	ADC0_VCM	B2B, J18	
TP5	ADC1_VCM	B2B, J18	
TP6	USB_VBUS	Micro USB2.0, J29	
TP7	UART0_RX	B2B, J17	
TP8	UART0_TX	B2B, J17	
TP9	ADC2_VCM	B2B, J18	
TP10	ADC3_VCM	B2B, J18	
TP11	ADC4_VCM	B2B, J18	
TP12	ADC5_VCM	B2B, J18	

Test Point	Signal	Connected to	Notes
TP13	ADC6_VCM	B2B, J18	
TP14	ADC7_VCM	B2B, J18	
TP15	PSBATT	Diode, D13	
TP16	CLKE_P	-	
TP17	CLKE_N	-	
TP18	CLKF_P	-	
TP19	CLKF_N	-	
TP20	CLKD_P	-	
TP21	CLKD_N	-	

Table 21: Test Points Information

6 On-board Peripherals

Chip/Interface	Designator	Notes
EEPROM (see page 25)	U15	
FTDI (see page 27)	U12	
Temperature Sensor (see page 26)	U9	
DIP Switch (see page 26)	S1, S2	
Push Button (see page 29)	BTN1	
LEDs (see page 29)	D1...11	
Oscillators (see page 29)	U16, U6	
PLL Clock Generator (see page 30)	U5	

Table 22: On board peripherals

6.1 EEPROM

There is an EEPROM U15 provided in order to store the FTDI configuration.

Pin	Schematic	Connected to	Notes
CS	EECS	FTDI, U12	
CLK	EECLK	FTDI, U12	
DIN	EEDATA	FTDI, U12	

Table 23: EEPROM information

6.2 DIP Switch

There are two DIP Switches S1, S2 provided for boot mode and manual input select of programmable clock generator. For more information please refer to Configuration Signal (see page 10) Section

Designator	Pin	Schematic	Connected to	Notes
S1	S1A	CPLD_IO0	B2B, J17	
	S1B	CPLD_IO1	B2B, J17	
	S1C	CPLD_IO2	B2B, J17	
	S1D	CPLD_JTAGEN	B2B, J17	
S2	S2A	DSPLL0_SEL0	Programmable clock Generator, U5	
	S2B	DSPLL0_SEL0	Programmable clock Generator, U5	

Table 24: DIP Switches information

6.3 Temperature Sensor

There is a temperature sensor IC U9 provided to capture the temperature and provides an alert when cooling is needed. the temperature IC is connected to I2C bus at address 0x4C.

Pin	Schematic	Connected to	Notes
TACH	FAN_TACH	Pin Header, J21	

Pin	Schematic	Connected to	Notes
PWM	FAN_PWM	Pin Header, J21	
D+	DX_P	Regulator, U8	
D-	DX_N	Regulator, U8	
nALERT	ALERT_N	I2C Switch, U7	
nTCRIT	THERM_N	pulled up to 3.3V	
SMBCLK	I2C_SCL_SNS	I2C Switch, U7	
SMBDAT	I2C_SDA_SNS	I2C Switch, U7	

Table 25: Temperature sensor information

6.4 FTDI

The FTDI chip U12 converts signals from USB2 to a variety of standard serial and parallel interfaces. Refer to the FTDI data sheet[1] to get information about the capacity of the FT2232H chip. FTDI FT2232H chip is used in MPPSE mode for JTAG, 2 I/O's of Channel B are routed to B2B J17 and must be used as UART.

The configuration of FTDI FT2232H chip is pre-programmed on the EEPROM U15.

FTDI Pin	Signal Schematic Name	Connected to	Notes
ADBUS0	JTAG_TCK	B2B, J17 Pin Header, J40	JTAG interface

1 http://www.ftdichip.com/Support/Documents/DataSheets/ICs/DS_FT2232H.pdf

FTDI Pin	Signal Schematic Name	Connected to	Notes
ADBUS1	JTAG_TDI	B2B, J17 Pin Header, J40	
ADBUS2	JTAG_TDO	B2B, J17 Pin Header, J40	
ADBUS3	JTAG_TMS	B2B, J17 Pin Header, J40	
BDBUS0	UART0_RX	B2B, J17	UART
BDBUS1	UART0_TX	B2B, J17	UART
EECS/ EECLK/ EEDATA	BDBUS2	EEPROM, U15	FTDI configuration
DM/DP	D_N/ D_P	Micro USB2.0, J29	FTDI Input

Table 26: FTDI chip interfaces and pins

6.5 Push Button

Designator	Connected to	Functionality	Note
BTN1	RESETN	General Reset	

Table 27: Push Button information

6.6 LEDs

Designator	Color	Connected to	Active Level	Note
D1	Green	PG_1.8V	High	
D2	Green	PG_3.3V	High	
D3	Green	PG_5V	High	
D6...11	Green	B2B, J18	High	User LED
D12	Green	Clock Generator, U5	High	

Table 28: On-board LEDs

6.7 Clock Sources

Designator	Description	Frequency	Note
U6	MEMS Oscillator	100 MHz	
U16	MEMS Oscillator	12 MHz	
Y1	Crystal Oscillator	54 MHz	

Designator	Description	Frequency	Note
U5	Programmable Clock Generator	Variable	

Table 29: Osillators

6.8 Programmable Clock Generator

There is a programmable clock generator on-board (U5) provided in order to generate variable clocks for the module. The I^2C Address is 0x68.

U5 Pin	Signal	Connected to	Direction	Note
IN0	CLKIN0	Oscillator, U6	Input	
IN1	CLKIN1	UMCC Connector, J36	Input	
IN2	CLKIN2	UMCC Connector, J37	Input	
IN3	FB	Programmable Clock Generator, U5	Input / Output	
XA/XB	CLK0_XA/XB	Oscillator, Y1	Input	
IN_SEL0...1	DSPLL0_SEL0...1	I2C Switch, U7 DIP Switch, S2	Input	
nINTR	DSPLL0_INTR_N	I2C Switch, U7	Input	

U5 Pin	Signal	Connected to	Direction	Note
nLOL	DSPLL0_LOL_N	Green LED, D12	Input	
nRST	DSPLL0_RST_N	1.8 V	Input	
SCLK	DSPLL0_SCL	I2C Switch, U7	Input	
SDA/SDIO	DSPLL0_SDA	I2C Switch, U7 Pin Header, J41	In/Out	
INTR	PLL_INTR_N	B2B, J17	Output	
OUT0A	CLKOUT0A	B2B, J17	Output	
OUT0	CLKOUT0_P	B2B, J17	Output	
OUT1	PLLCLK1	UMMC, J27	Output	
OUT2	PLLCLK2	UMMC, J20	Output	
OUT3	PLLCLK3	UMMC, J32	Output	
OUT4	PLLCLK4	UMMC, J33	Output	
OUT5	PLLCLK5	UMMC, J34	Output	

U5 Pin	Signal	Connected to	Direction	Note
OUT 6	PLLCLK6	UMMC, J35	Output	
OUT 7	CLKOUT7	UMMC, J38	Output	
OUT 8	CLKOUT8	UMMC, J42	Output	
OUT 9	CLKOUT9	UMMC, J43	Output	
OUT 9A	CLKOUT9A	Programmable Clock Generator, U5	Output	

Table 30: Programmable Clock Generator Inputs and Outputs

7 Power and Power-On Sequence

7.1 Power Supply

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

7.2 Power Consumption

Power Input Pin	Typical Current
VIN	TBD*

Table 31: Power Consumption
* TBD - To Be Determined

7.3 Power Distribution Dependencies

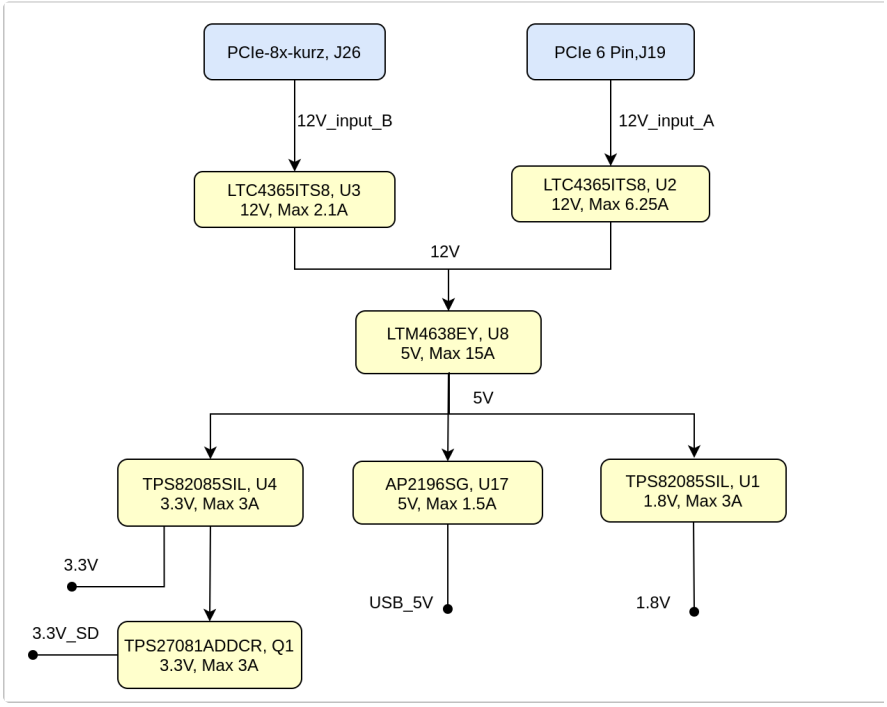

Figure 3: Power Distribution

7.4 Power-On Sequence

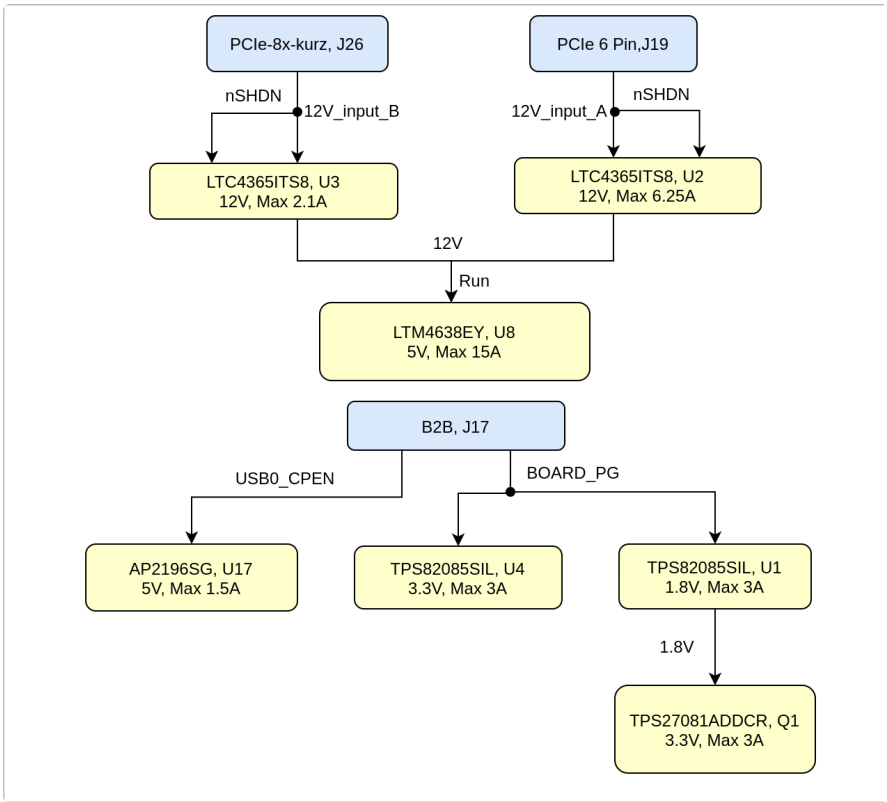

Figure 4: Power Sequency

7.5 Power Rails

Power Rail Name	B2B JM17	B2B JM2	Direction	Notes
5V	1,2,3,4,5,6,8	-	Ouput	
PSBATT	14	-	Output	
3.3V_MODULE	16	-	Input	

Table 32: Module power rails.

8 Board to Board Connectors

The module has two 160-pin double-row REF-192552-02 connector on the bottom side. The counterpart REF-192552-01 is placed on the Baseboard.

Order number	REF Number	Samtec Number	Type	Mated Height	Data sheet	Comment
27220	REF-192552-02	ST5-80-1.50-L-D-P-TR	Module connector	5 mm	http://suddendocs.samtec.com/catalog_english/st5.pdf	Standard connector used on module
27219	REF-192552-01	SS5-80-3.50-L-D-K-TR	Baseboard connector	5 mm	http://suddendocs.samtec.com/catalog_english/ss5.pdf	Standard connector used on board

Table 33: Connectors.

With different connectors from the used series other mating heights are possible (according to the Datasheet[2]). The module and base board can be manufactured using other connectors upon request.

Connector Specifications	Value
Insulator material	Liquid crystal polymer
Stacking height	5 mm
Contact material	Phosphor-bronze

2 http://suddendocs.samtec.com/catalog_english/ss5.pdf

Connector Specifications	Value
Plating	Au or Sn over 50 µ" (1.27 µm) Ni
Current rating	1.6 A per pin (2 pins powered)
Operating temperature range	-55 °C to +125 °C
RoHS compliant	Yes

Table 34: Connector specifications.

8.1 Connector Speed Ratings

The LSHM connector speed rating depends on the stacking height; please see the following table:

Stacking height	Speed rating
5 mm, Single-Ended	13.5GHz / 27Gbps
5 mm, Differential	20GHz / 40Gbps
4 mm, Single-Ended	13GHz / 26Gbps
4 mm, Differential	13.5GHz / 27Gbps

Table 35: Speed rating.

8.2 Current Rating

Current rating of Samtec Razor Beam™ SS5/ST5 B2B connectors is 1.6A per pin (2 pins powered).

8.3 Connector Mechanical Ratings

- Shock: 100G, 6 ms sawtooth wave
- Vibration: 7.56G 'RMS', 2 hours per axis, 3 axes total

9 Technical Specifications

9.1 Absolute Maximum Ratings

Symbols	Description	Min	Max	Unit
VIN	Input Supply Voltage	2.5	34	V
ADC_V	Analog input voltage	-5.0	5.0	V
DAC_V	Digital input voltage	-5.0	5.0	°C
T_STG	Storage Temperature	-55	125	°C

Table 36: PS absolute maximum ratings

9.2 Recommended Operating Conditions

Operating temperature range depends also on customer design and cooling solution. Please contact us for options.

Parameter	Min	Max	Units	Reference Document
VIN	11	13	V	See the datasheet.
ADC_V	0	5	V	See the SMA datasheet
DAC_V	0	5	V	See the UMCC datasheet
T_OPT	-40	+85	°C	See RF Transformer datasheet.

Table 37: Recommended operating conditions.

9.3 Physical Dimensions

- Module size: 106.6 mm × 167.7 mm. Please download the assembly diagram for exact numbers.
- Mating height with standard connectors: 5 mm.

PCB thickness: 1.5 mm.

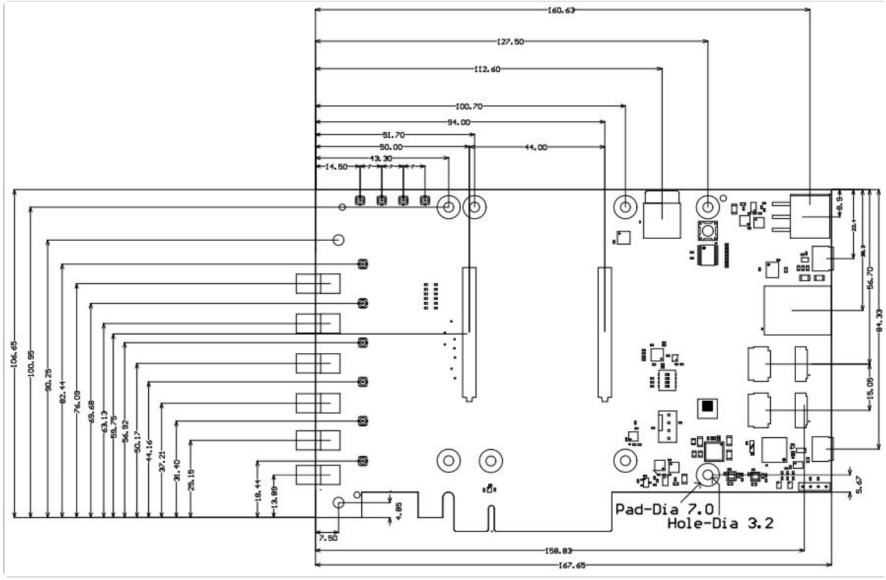

Figure 5: Physical Dimension

10 Currently Offered Variants

Trenz shop TEB0835 overview page	
English page[3]	German page[4]

Table 38: Trenz Electronic Shop Overview

3 https://shop.trenz-electronic.de/en/search?sSearch=TEB0835
4 https://shop.trenz-electronic.de/de/search?sSearch=TEB0835

11 Revision History

11.1 Hardware Revision History

Date	Revision	Changes	Documentation Link
2019-11-29	REV01	Initial Release	REV01[5]
2020-08-13	REV02	1. All module's mount holes are connected to GND; 2. CLK_Connectors. Added baluns for each clock inputs; 3. Internal DSPLL is changed on SI5395A-A-GM; 4. Added ability to use internal DSPLL as a source for each clock; 5. Added clock inputs CLKIN1, CLKIN2 and clock outputs OUT1 , OUT2 connected to DSPLL.; 6. All clock traces are matched with tolerance 0.2 mm; 7. Lengths of inputs ADC0, ADC2, ADC4, ADC6 are matched with tolerance 0.2 mm; 8. Lengths of outputs DAC0 and DAC2 are matched with tolerance 0.2 mm; 9. Lengths of outputs DAC4, DAC5, DAC6, DAC7 are matched with tolerance 0.2 mm;	REV02[6]

5 https://shop.trenz-electronic.de/Download/?path=Trenz_Electronic/Modules_and_Module_Carriers/5.2x7.6/TE0835/REV01
6 https://shop.trenz-electronic.de/Download/?path=Trenz_Electronic/Modules_and_Module_Carriers/6.5x9/6.5x9_Carriers/TEB0835/REV02

Date	Revision	Changes	Documentation Link
		10. In REV02: FTDI is powered from 3.3V_Module; 11. Signal PLL_INTR_N is removed; 12. Signal BOARD_PG is renamed in MODULE_PG; 13. Added ability to select enable signal for internal DC-DCs 3.3V and 1.8V. 14. Added JTAG connector J40. 15. Added VBAT schematic. Added a holder for CR1220 3V battery	

Table 39: Hardware Revision History

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

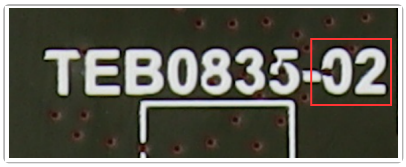

Figure 6: Board hardware revision number.

11.2 Document Change History

Date	Revision	Contributor	Description
2024-08-27	v.56 (see page 7)	John Hartfiel[7]	• Board to Board Con

7 https://wiki.trenz-electronic.de/display/~j.hartfiel

Date	Revision	Contributor	Description
			nectorSection: BugfixIncludeMacro
2023-08-04	v.55	Manuela Strücker	• updated download link
2023-01-17	v.54	Kerstin Möller	• Style update
2020-12-21	v.51	Pedram Babakhani	• Update to Revisio

Date	Revision	Contributor	Description
			n 02
--	all	Pedram Babakhani[8] , John Hartfiel[9] , Kerstin Möller[10] , Manuela Strücker[11]	• --

Table 40: Document change history.

8 https://wiki.trenz-electronic.de/display/~P.Babakhani
9 https://wiki.trenz-electronic.de/display/~j.hartfiel
10 https://wiki.trenz-electronic.de/display/~k.moeller
11 https://wiki.trenz-electronic.de/display/~m.struecker

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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

12 http://guidance.echa.europa.eu/
13 https://echa.europa.eu/candidate-list-table
14 http://www.echa.europa.eu/

consisting of the crossed-out wheeled bin indicates separate collection for waste electrical and electronic equipment.

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