User's Manual, V 4.0, December 2007

# TriBoard TC179X

## Hardware Manual TC179X.400

Microcontrollers

Never stop thinking.

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**TriBoard TC179X Hardware Manual TC179X.400**

| **Revision History:** | **2007-12** | V 4.0 |
|---|---|---|
| Previous Version: | TriBoard TC179X V3.2 | |

| Page | Subjects (major changes since last revision) |
|---|---|
| | changes for new TriBoard design |
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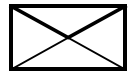

Table of Contents Page

**Table of Contents** **Page**

## List of Figures

## List of Figures

Page

## List of Tables

Page

## List of Tables

Page

# 1 Introduction

We congratulate you on your purchase of the TriCore Evaluation Board. This kit is a versatile tool, providing quick access to the capabilities of TriCore's powerful architecture.

Applications can be developed easily. The Evaluation Board is equipped with a variety of memories and peripherals for connection to the environment. There is also an interface for the On Chip Debugging Features (OCDS1 and DAP). The kit also includes several sets of development tools, which are stored on the included Evaluation Board CD-ROM.

The Evaluation Board allows easily the development of TriCore applications with the corresponding tools.

Subsequently, the applications can be downloaded and can be tested with the powerful debugger software.

This TriBoard Hardware Manual familiarizes you with the TriCore Evaluation Board and guides you through the initial configuration of the TriBoard.

For detailed technical information about the TC179X please refer to the Target Specification of the corresponding device.

# 2 TriBoard Features

The TriBoard TC179X is soldered with a device of the TC179X. This device fit into all members of this product family so that there are no special TriBoards necessary.

## 2.1 Summary of Features

- Infineon's TC179X (TC1792,TC1796,TC1797) Controller in PBGA416 Package
- Burst Flash up to 16MBytes
- asynchronous SRAM up to 1MByte
- FlexRay Transceivers, High Speed CAN Transceivers, USB to UART bridge
- Crystal 20MHz (default), Oscillator or External Clock
- USB miniWiggler for easy debugging
- 8 Low Power Status LEDs
- 8-DIP switches for configuration
- access to all pins of controller
- 100mm x 160mm (EURO-Board)

### Connectors

The TC179X TriBoard offers a wide variety of connectors:

- Standard power connector
- USB connector for ASC Interface (ASC0) and miniWiggler
- 16-pin header for JTAG interface (OCDS)
- 10-pin header for DAP (only TC1797)
- 2 x 10pin (2x5) Header for CAN High Speed Transceiver (CAN0 and CAN1)
- four 80-pin connectors (male) + four 80-pin connectors (female) with all I/O signals
- optional ETK connector

### Components

- Next generation micro controller supply TLE 7368 G
- Three LEDs to validate power supply (5Volt / 3,3 Volt / 1,5 Volt)
- LED indicating /HDRST (ESR0) active state
- LED indicating activ miniWiggler
- LED switched via DAS software
- FlexRay Communcation Controller SAK-CIC310 (if not with TC1797)
- 2 x FlexRay Transceiver AS8221
- 2 x CAN-Transceiver TLE 6250 GV33
- USB to UART bridge FT2232D
- SPI eeprom
- 8 general purpose LEDs
- Reset switch
- 8-pin Dip switch

## Zero Ohm Bridges

Zero Ohm resistors give the flexibility to configure the systems functionality

## 2.2 Block Diagram

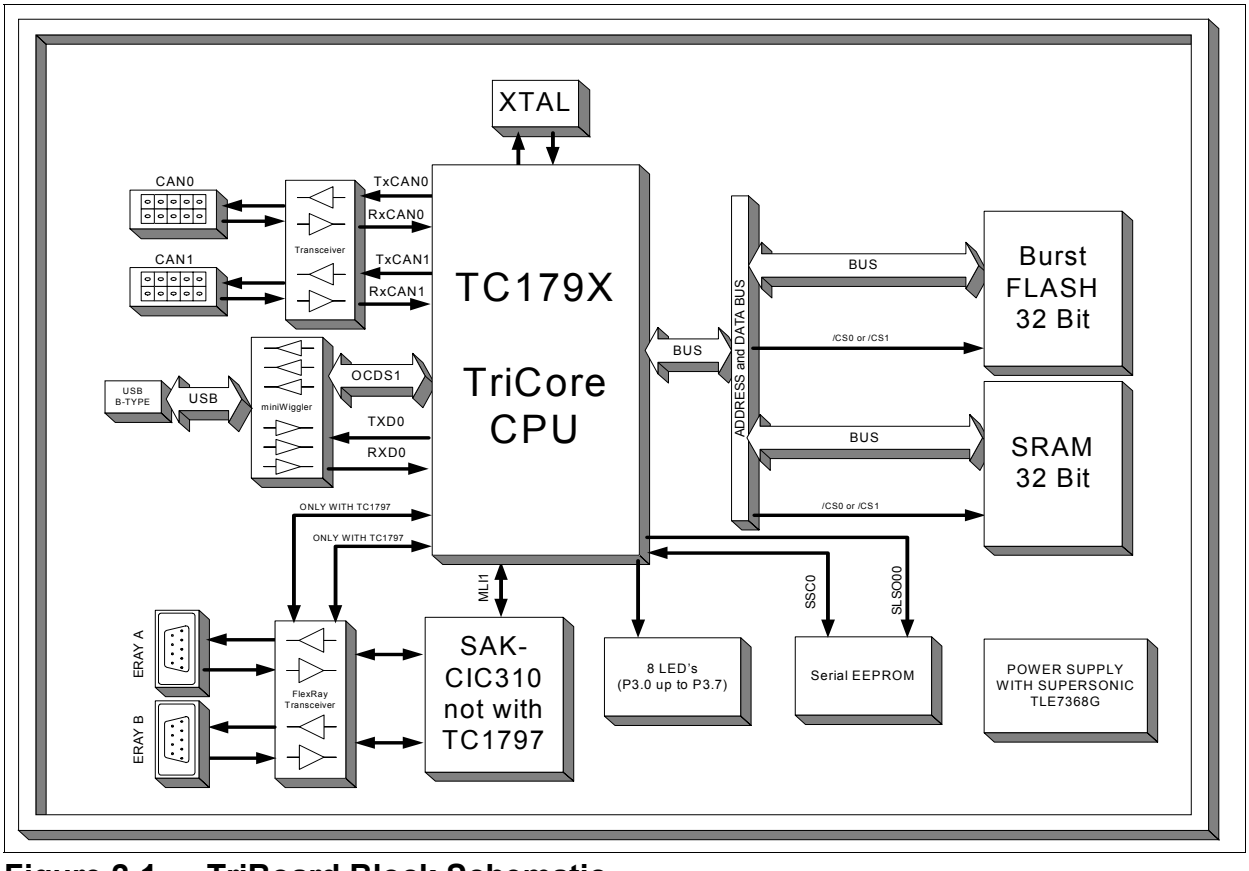


**Figure 2-1 TriBoard Block Schematic**

## 2.3 Placement

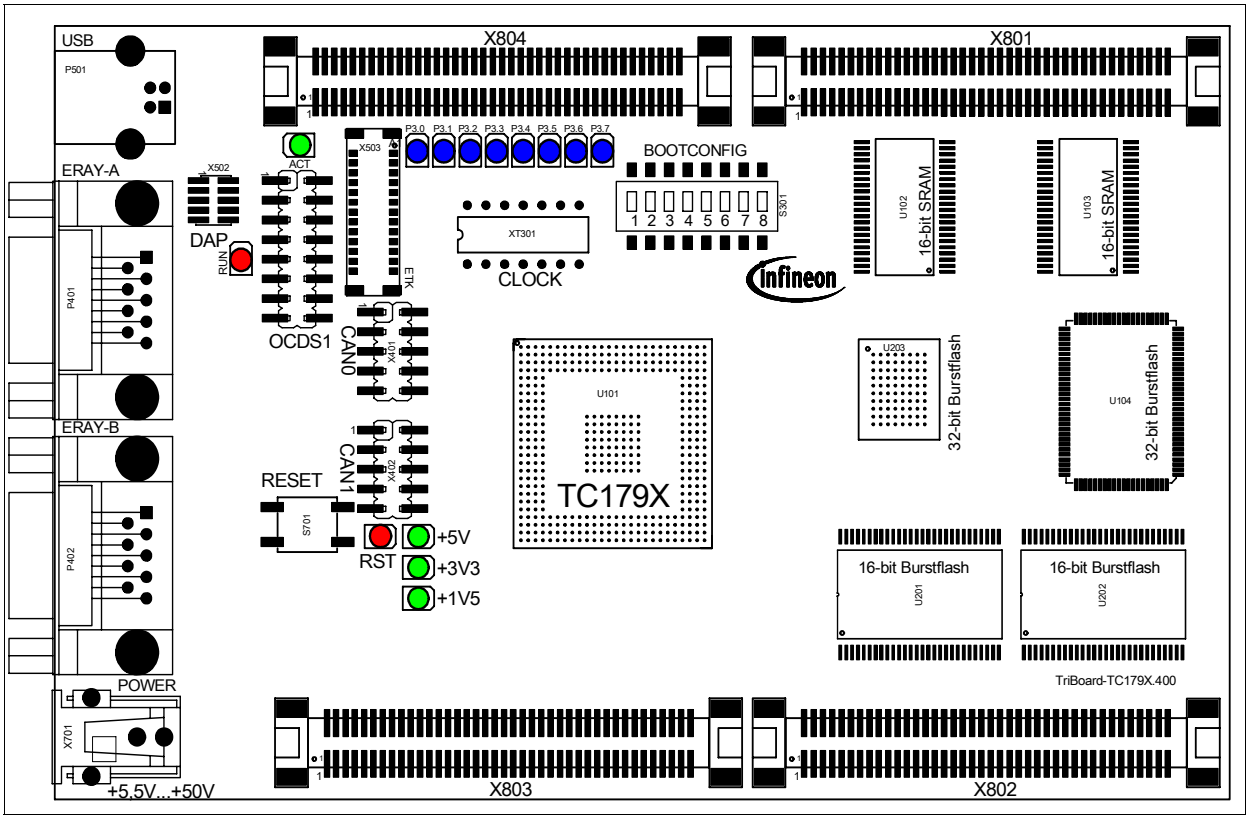


**Figure 2-2 TriBoard-T179X.400 Placement**

# 3 TriBoard Information

## 3.1 Power Supply

The Board has to be connected to a +5,5V to +60V DC power supply. The TriBoard generates internally +3.3V, +1.5V and +5V. The power consumption is not specified yet but a supply with 6V and 500mA should be sufficient. The pinout for the supply connector is shown in **Figure 7-5**. There can be used any standard power pack with a connector where the positive line is surrounded by the ground line.

Applying a stable supply voltage causes the power on reset after a short period. The four LED's (+5V, +3.3V, +1.5V) indicate the status of the on board generated voltage (if the LEDs are assembled).

A manual reset is executed by pressing the reset button.

## 3.2 LEDs

There are 14 LEDs on board:

- D601 up to D608 (blue) -> toogle LEDs connected to P3.0 ... P3.7
- D704 RST (red) -> RESET LED indicate the reset state of the board
- D705 +1V5 (green) -> +1,5V power supply indication
- D706 +3V3 (green) -> +3,3V power supply indication
- D707 +5V (green) -> +5V power supply indication
- D502 ACT (green) -> on board MiniWiggler is ACTIV
- D501 RUN (red) -> Debug RUN mode (switched by DAS Server)

## 3.3 Clock

There are three possibilities to apply the CPU clock.

- Large oscillator circuit (DIP14)
- Small oscillator circuit (DIP8)
- Crystal oscillator (default with 20MHz)
- External clock generator

The crystal oscillator and the oscillator circuit use the socket XT301. It's possible to apply a 14pol DIP oscillator package or an 8pol DIP oscillator package.

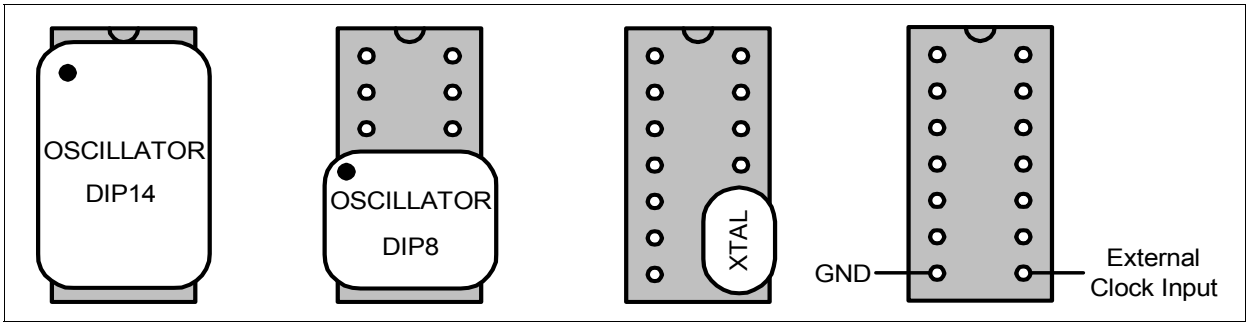


**Figure 3-1 Clock socket usage (XT301)**

## 3.4 Memory

The TriBoard supports the following memory configurations:

- up to 8 MBytes external Burst Flash (2x16Bit) or
- 4 MBytes external Burst Flash (1x32Bit) or
- up to 4MBytes external Burst Flash (1x16Bit) - only with TC1797
- 1 MBytes external asynchronous SRAM (2x16Bit) or
- up to 8 MBytes external synchronous SRAM (1x32Bit) or
- 512 KBytes external asynchronous SRAM (1x16Bit) - only with TC1797

For the OnBoardMemory are reserved chip select 0 and 1. Therefore only two parts, e.g. 2x16Bit Flash and 2x16Bit asynchronous SRAM, should be assembled and can be used at the same time. Chip Select 2 and 3 are not used on the board and can be used externally.

The Board supports programming though the JTAG port (OCDS1).

## 3.5 FLASH

The flash uses 32 Data Bits (AD0...AD31) and 20, 21 or 22 Address Bits (A0...A19,A20 or A21). It's accessed via /CS0 or /CS1. Each type of flash has its own resistor to connect to /CS0 or /CS1. To connect different flashs see **Table 4-5**.

*Note: Only +3,3V Flash is usable with this board.*

## 3.6 SRAM

The SRAM uses 32 Data Bits (AD0...AD31) and up to 22 Address Bits (A0...A20).

It's accessed via /CS0 or /CS1. Each type of SRAM has its own resistor to connect to /CS0 or /CS1. To connect different SRAMs see **Table 4-5**.

*Note: Only +3,3V SRAM is usable with this board.*

## 3.7 USB Connector

The USB connector is used for connection to a PC. Via the USB it is possible to power the board, using the ASC0 as serial connection via USB and Debugging via DAS. For the pinout of USB socket see **Figure 7-6**.

NOTE: Before connecting the board to the PC, make sure that the actual DAS software is installed on the PC. For actual DAS software please contact your local FAE.

The software can also be found on the

*DAS website*

### 3.7.1 Serial Connection to PC

After the first connection of USB to a PC the needed driver will be installed automatically. During this there will be created a new COM port on PC. This COM port can be used to communicate with the board via ASC0 of the device (e.g. bootstrap loader).

### 3.7.2 MiniWiggler

MiniWiggler is a low cost debug tool which allows you access to the JTAG of the device. Make sure that you have the latest DAS release. Debugging is possible via the DAS Server JTAG over USB Chip. Please contact your prefered debug vendor for support of DAS.

If you have connected the board to the PC and there runs the DAS server, then a working connection is visible via the green ACTIV LED.

The status RUN LED is switched on/off through the DAS Server, depending on the used debugger (client).

IMPORTANT: Make sure that there is no or a tristated connection on X501 (OCDS1) and X502 (DAP) if the ACTIV LED is on.

## 3.8 FlexRay (E-Ray)

The board has 2 SUB-D connectors for FlexRay Communication with up to 10 Mbit/s.

If the controller has an E-Ray modul (like TC1797) then the transceiver are connected directly to the controller, else there is the SAK-CIC310 (IFlex) assembled and the transceiver are connected to the IFlex.

If the SAK-CIC310 is assembled, then the IFlex is connected to MLI1 of the controller. As interrupts inputs of TC179X are used P7.0, P7.1, P7.4 and P7.5.

For more information look in the user manual for TC1797 or SAK-CIC310 and the schematics **Figure 8-5**.

## 3.9 Serial Eeprom

The SSC0 of the TC179X is connected to a serial EEPROM with a size of 128K (16.384 x 8). As chip select for this EEPROM is used the line SLSO0 (P10.4). To disconnect (disable) the EEPROM remove resistor R453.

## 3.10 MultiCAN

On the board are two CAN transceiver connected to the MultiCAN on TC179X node 0 and 1. The transceivers are connected to two IDC10 plug. For the pinout of IDC10 plug see **Figure 7-8**. You can use a IDC female connector with crimpconnector, flat cable and SUB-D 9 plug with crimpconnector to have a 1:1 adapter to SUB-D 9.

## 3.11 Other peripherals

For all other peripherals there are no special plugs on the board. The peripheral signals are available on the different connectors. See **“Connector Pin Assignment” on Page 7-1**.

*Note: - SLSO0 is used as chip select for the serial eeprom on board.*

## 3.12 Toggle LED’s

Port 3 pin 0 up to pin 7 are connected to single LED’s (D601... D608) and can be controlled by Software. This status LED’s are low active.

## 3.13 Debug System

### 3.13.1 OCDS1

The OCDS1 signals are connected to the IDC16 plug (X501). They work with the port supply of +3.3V. For pinout of the connector see **Figure 7-9**. You can connect any debugger to this connector.

The signals /BRKIN and /BRKOUT are not connected per default. If you need this signals in the connector then assemble R525 and R524 with a 0R resistor.

If you connect a debug hardware make sure that the MiniWiggler (see **“MiniWiggler” on Page 3-3**) is not activ (ACTIV LED is off) and on the DAP connector (X502) is no hardware connected or the hardware is tristated.

If the ACTIV LED is on, then stop the active DAS Server JTAG over USB Chip and/or remove the USB connection to the PC.

### 3.13.2 DAP

If the board comes with a TC1797 then the DAP connector (X502) is available. For pinout of this connector see **Figure 7-10**. You can connect a DAP hardware here. If you use this connector make sure that the MiniWiggler is not activ (ACTIV LED is off) and a connected OCDS1 hardware is disconnected or tristated.

# 4 TriBoard Configuration

## 4.1 HW Boot Configuration TC1797

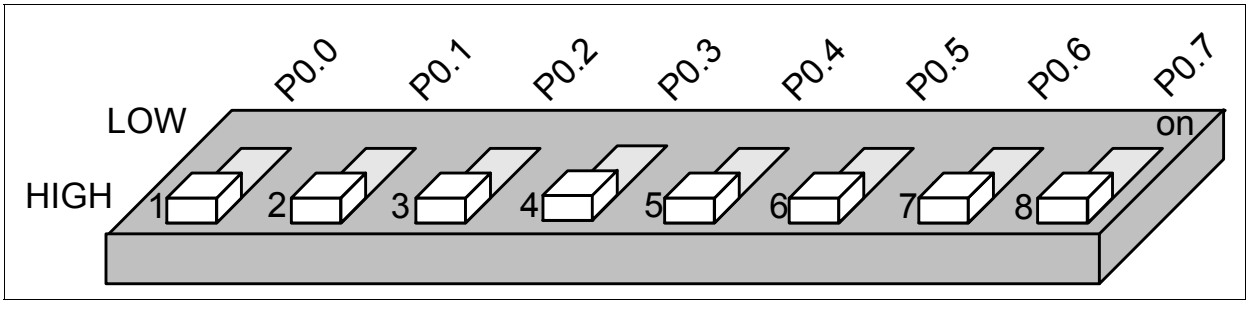


**Figure 4-1 HW Configuration TC1797 DIP-Switch**

The picture above shows the definition of the boot HW configuration switch. The meaning of the switches will be described in the following table (**Table 4-1**).

*Note: The ON position of the switch is equal to a logical LOW at the dedicated pin.*

**Table 4-1 User Startup Modes for TC1797**

*Note: The shadowed line indicates the default setting.*

*Note: 'x' represents the don't care state.*

*Note: 1 to 8 are the Dip Switch numbers*

| HWCFG[7...0] | Type of Boot TC1797 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 11XXXXXX | Internal Start from Flash | X | X | X | X | X | X | OFF | OFF |
| 010XXXX0 | Bootstrap Loader Mode, Generic Bootloader at CAN pins | ON | X | X | X | X | ON | OFF | ON |
| 10101XX0 | Bootstrap Loader Mode, ASC Bootloader | ON | X | X | OFF | ON | OFF | ON | OFF |
| 10100XX0 | Internal Alternate Boot Mode, ASC Bootloader on fail | ON | X | X | ON | ON | OFF | ON | OFF |
| 1011XXXX | Internal Alternate Boot Mode, Generic Bootloader at CAN pins on fail | X | X | X | X | OFF | OFF | ON | OFF |

**Table 4-1 User Startup Modes for TC1797**

*Note: The shadowed line indicates the default setting.*

*Note: 'x' represents the don't care state.*

*Note: 1 to 8 are the Dip Switch numbers*

| HWCFG[7...0] | Type of Boot TC1797 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 10010110 | External Alternate Boot Mode (EBU arbiter), ASC Bootloader on fail | ON | OFF | OFF | ON | OFF | ON | ON | OFF |
| 10010100 | External Alternate Boot Mode (EBU participant), ASC Bootloader on fail | ON | ON | OFF | ON | OFF | ON | ON | OFF |
| 10010010 | External Alternate Boot Mode (EBU arbiter), ASC Bootloader on fail, FNA mode | ON | OFF | ON | ON | OFF | ON | ON | OFF |
| 10010000 | External Alternate Boot Mode (EBU participant), ASC Bootloader on fail, FNA mode | ON | ON | ON | ON | OFF | ON | ON | OFF |
| 10011110 | External Alternate Boot Mode (EBU arbiter), Generic Bootloader at CAN pins on fail | ON | OFF | OFF | OFF | OFF | ON | ON | OFF |
| 10011100 | External Alternate Boot Mode (EBU participant), Generic Bootloader at CAN pins on fail | ON | ON | OFF | OFF | OFF | ON | ON | OFF |
| 10011010 | External Alternate Boot Mode (EBU arbiter), Generic Bootloader at CAN pins on fail, FNA mode | ON | OFF | ON | OFF | OFF | ON | ON | OFF |
| 10011000 | External Alternate Boot Mode (EBU participant), Generic Bootloader at CAN pins on fail, FNA mode | ON | ON | ON | OFF | OFF | ON | ON | OFF |
| 00100110 | External Start from /CS0 (EBU arbiter), Default EBU Configuration | ON | OFF | OFF | ON | ON | OFF | ON | ON |
| 00101110 | External Start from /CS0 (EBU arbiter), Automatic EBU Configuration | ON | OFF | OFF | OFF | ON | OFF | ON | ON |

**Table 4-1 User Startup Modes for TC1797**

*Note: The shadowed line indicates the default setting.*

*Note: 'x' represents the don't care state.*

*Note: 1 to 8 are the Dip Switch numbers*

| HWCFG[7...0] | Type of Boot TC1797 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 00100010 | External Start from /CS0 (EBU arbiter), Default EBU Configuration, FNA mode | ON | OFF | ON | ON | ON | OFF | ON | ON |
| 00101010 | External Start from /CS0 (EBU arbiter), Automatic EBU Configuration, FNA mode | ON | OFF | ON | OFF | ON | OFF | ON | ON |
| 00100100 | External Start from /CS0 (EBU participant), Default EBU Configuration | ON | ON | OFF | ON | ON | OFF | ON | ON |
| 00101100 | External Start from /CS0 (EBU participant), Automatic EBU Configuration | ON | ON | OFF | OFF | ON | OFF | ON | ON |
| 00100000 | External Start from /CS0 (EBU participant), Default EBU Configuration, FNA mode | ON | ON | ON | ON | ON | OFF | ON | ON |
| 00101000 | External Start from /CS0 (EBU participant), Automatic EBU Configuration, FNA mode | ON | ON | ON | OFF | ON | OFF | ON | ON |
| 0001X000 | Bootstrap Loader Mode, Generic Bootloader at CAN pins, FNA mode | ON | ON | ON | X | OFF | ON | ON | ON |
| 0001X010 | Bootstrap Loader Mode, ASC Bootloader, FNA mode | ON | OFF | ON | X | OFF | ON | ON | ON |
| 0001X100 | External ABM, Generic Bootloader, Default EBU Configuration, FNA mode | ON | ON | OFF | X | OFF | ON | ON | ON |
| 0001X110 | External ABM, ASC Bootloader, Default EBU Configuration, FNA mode | ON | OFF | OFF | X | OFF | ON | ON | ON |
| all others | reserved; don't use this combination | | | | | | | | |

## 4.2 HW Boot Configuration all other TC179X

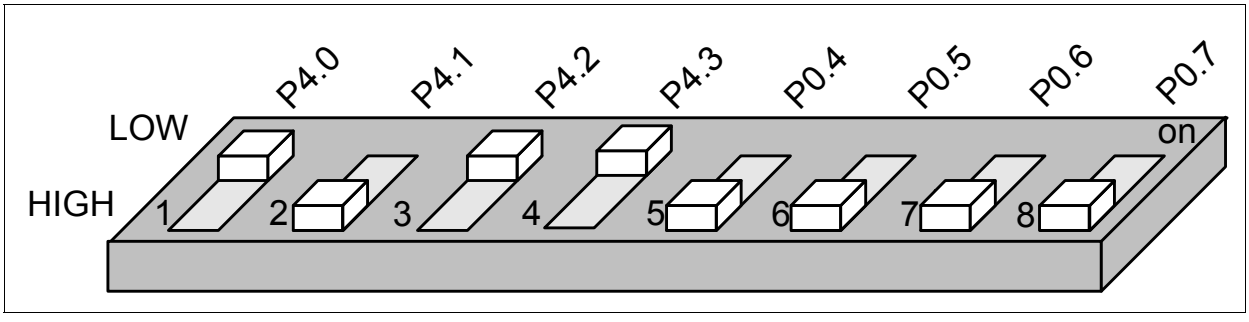


**Figure 4-2 HW Configuration for all other TC179X DIP-Switch**

The picture above shows the definition of the boot HW configuration switch. The meaning of the switches will be described in the following table (**Table 4-2**).

*Note: The ON position of the switch is equal to a logical LOW at the dedicated pin.*

**Table 4-2 HW Boot Configuration for all other TC179X**

*Note: The shadowed line indicates the default setting.*

*Note: 'x' represents the don't care state.*

*Note: 1 to 8 are the Dip Switch number*

| P4[3...0] | P0[7...4] | Type of Boot TC179X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0000 | XXXX | Serial boot from ASC0 to PMI scratchpad via ASC0 pins, run loaded program | ON | ON | ON | ON | X | X | X | X |
| 0001 | XXXX | Serial boot from CAN0 to PMI scratchpad, run loaded program | OFF | ON | ON | ON | X | X | X | X |
| 0010 | XXXX | Start from internal flash | ON | OFF | ON | ON | X | X | X | X |
| 0011 | XXXX | Alternate Boot Mode, Generic Boot Loader on fail depends on P0[2...0] | OFF | OFF | ON | ON | X | X | X | X |
| 0100 | XXXX | Start from external memory with EBU as master, using /CS0, automatic EBU Configuration | ON | ON | OFF | ON | X | X | X | X |

**Table 4-2 HW Boot Configuration for all other TC179X**

*Note: The shadowed line indicates the default setting.*

*Note: 'x' represents the don't care state.*

*Note: 1 to 8 are the Dip Switch number*

| P4[3...0] | P0[7...4] | Type of Boot TC179X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0101 | XXXX | External ABM with EBU as master, using /CS0, automatic EBU Configuration, Generic Boot Loader on fail depends on P0[2...0] | OFF | ON | OFF | ON | X | X | X | X |
| 0110 | XXXX | Start from external memory with EBU as participant, using /CS0, automatic EBU Configuration | ON | OFF | OFF | ON | X | X | X | X |
| 0111 | XXXX | External ABM with EBU as participant, using /CS0, automatic EBU Configuration, Generic Boot Loader on fail depends on P0[2...0] | OFF | OFF | OFF | ON | X | X | X | X |
| 1000 | XXXX | Boot from emulation memory (ED only) | ON | ON | ON | OFF | X | X | X | X |
| 1111 | XXXX | Serial boot from ASC0 to PMI scratchpad via CAN0 pins, run loaded program | OFF | OFF | OFF | OFF | X | X | X | X |
| all others | all others | reserved; don't use this combination | | | | | | | | |

## 4.3 Assembly Options

**Table 4-3 General optional resistors**

| Component | Description |
|---|---|
| R305 | XTAL Rserial (default: assembled) |
| R306 | XTAL Rparallel (default: not assembled) |
| R523 | Connect /BRKOUT with MiniWiggler (default: not assembled) |
| R524 | Connect /BRKOUT with OCDS1 connector (default: not assembled) |
| R527 | Connect /BRKIN with USR1 of MiniWiggler (default: not assembled |
| R529 | Connect /BRKIN with USR1 of DAP (default: not assembled |
| R525 | Connect /BRKIN with OCDS1 connector(default: not assembled) |
| R528 | Connect /TESTMODE with USR1 of MiniWiggler (default: not assembled |
| R530 | Connect /TESTMODE with USR1 of DAP (default: not assembled |
| R526 | Connect /TESTMODE with OCDS1 connector(default: not assembled) |
| R532 | Connect debug reset with /PORST(default: assembled) |
| R531 | Connect debug reset with /HDRST (default:not assembled) |
| R610 | Connect +3,3V to all toggle LEDs (default: assembled) |
| R723 | Connect reset switch with /PORST(default: assembled) |
| R724 | Connect reset switch with /HDRST (default:not assembled) |
| R704 | Connect P1.2 with MONSTBY of power device (default: not assembled) |
| R706 | Connect P1.3 with WDO of power device (default: not assembled) |
| R709 | Connect P1.15 with WDI of power device (default: not assembled) |

*Note: All resistors are red marked in the following figures*

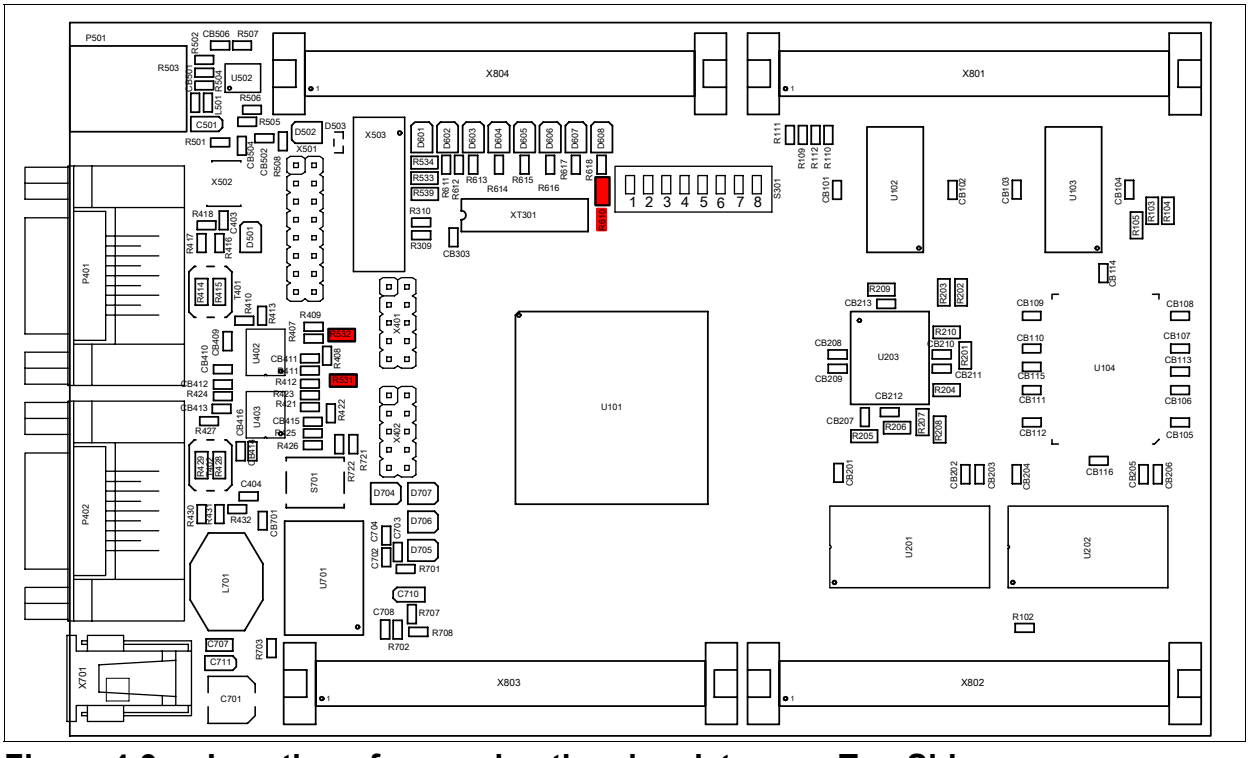


**Figure 4-3 Location of general optional resistors on Top Side**

**Figure 4-4 Location of general optional resistors on Bottom Side**

**Table 4-4 Resistors for peripherals**

| Component | Description |
|---|---|
| R433 | Connect P6.8 with RXD of CAN0 transceiver (default: assembled) |
| R439 | Connect P6.10 with RXD of CAN1 transceiver (default: assembled) |
| R453 | Connect P10.4 (SLSO0) with /CS of Eeprom (default: assembled) |
| R540 | Connect P5.0 with TXD of USB to UART (default: assembled) |
| R604 | Connect VAREF0 with VDDM (default: assembled) |
| R605 | Connect VAGND0 with VSSM (default: assembled) |
| R606 | Connect VAREF1 with VDDM (default: assembled) |
| R607 | Connect VAGND1 with VSSM (default: assembled) |
| R601 | Connect VAREF2 with VDDM (default: assembled) |
| R608 | Connect VFAREF with VDDMF (default: assembled) |
| R609 | Connect VFAGND with VSSMF (default: assembled) |
| R620 | Connect +5V with VDDM (default: assembled on TC1797) |
| R621 | Connect +3,3V with VDDM (default: assembled if not TC1797) |

*Note: All resistors are red marked in the following figures*

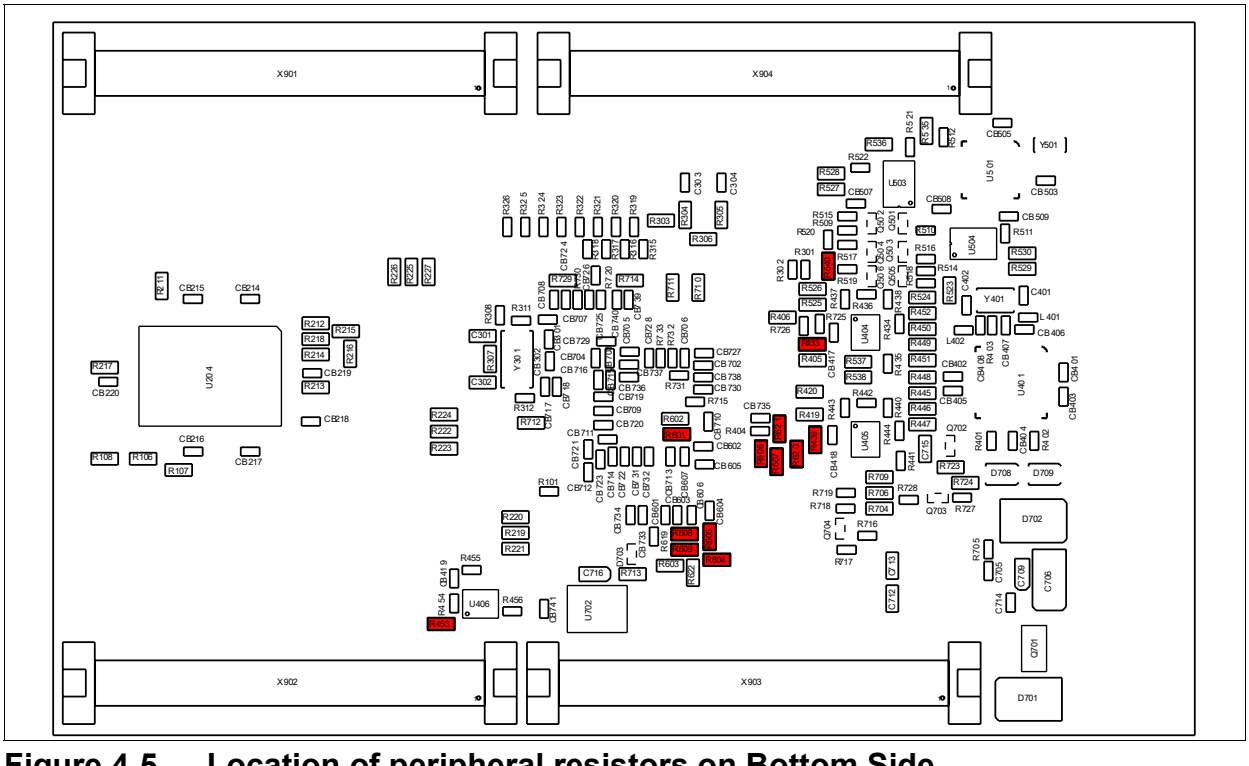


**Figure 4-5 Location of peripheral resistors on Bottom Side**

**Table 4-5 Resistors for memories**

| Component | Description |
|---|---|
| R103 | Connect /CS1 to 16-bit SRAMs (default: assembled) |
| R104 | Connect /CS0 to 16-bit SRAMs (default: not assembled) |
| R106 | Connect /CS1 to 32-bit SRAM (default: not assembled) |
| R107 | Connect /CS0 to 32-bit SRAM (default: not assembled) |
| R219 | Connect /CS0 to 16-bit Flashs (default: assembled) |
| R220 | Connect /CS1 to 16-bit Flashs (default: not assembled) |
| R222 | Connect /CS0 to 32-bit BGA Flash (default: not assembled) |
| R223 | Connect /CS1 to 32-bit BGA Flash (default: not assembled) |
| R225 | Connect /CS0 to 32-bit PQFP Flash (default: not assembled) |
| R226 | Connect /CS1 to 32-bit PQFP Flash (default: not assembled) |

*Note: All resistors are red marked in the following figures*

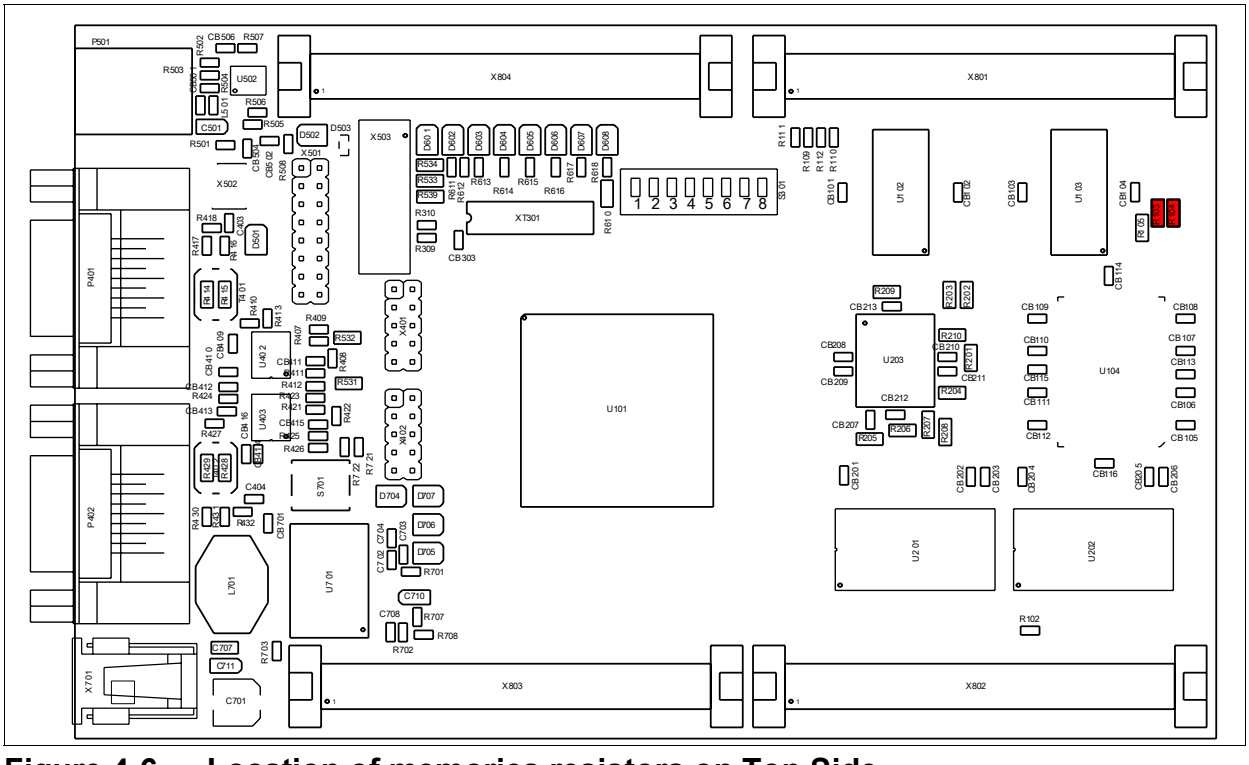


**Figure 4-6 Location of memories resistors on Top Side**

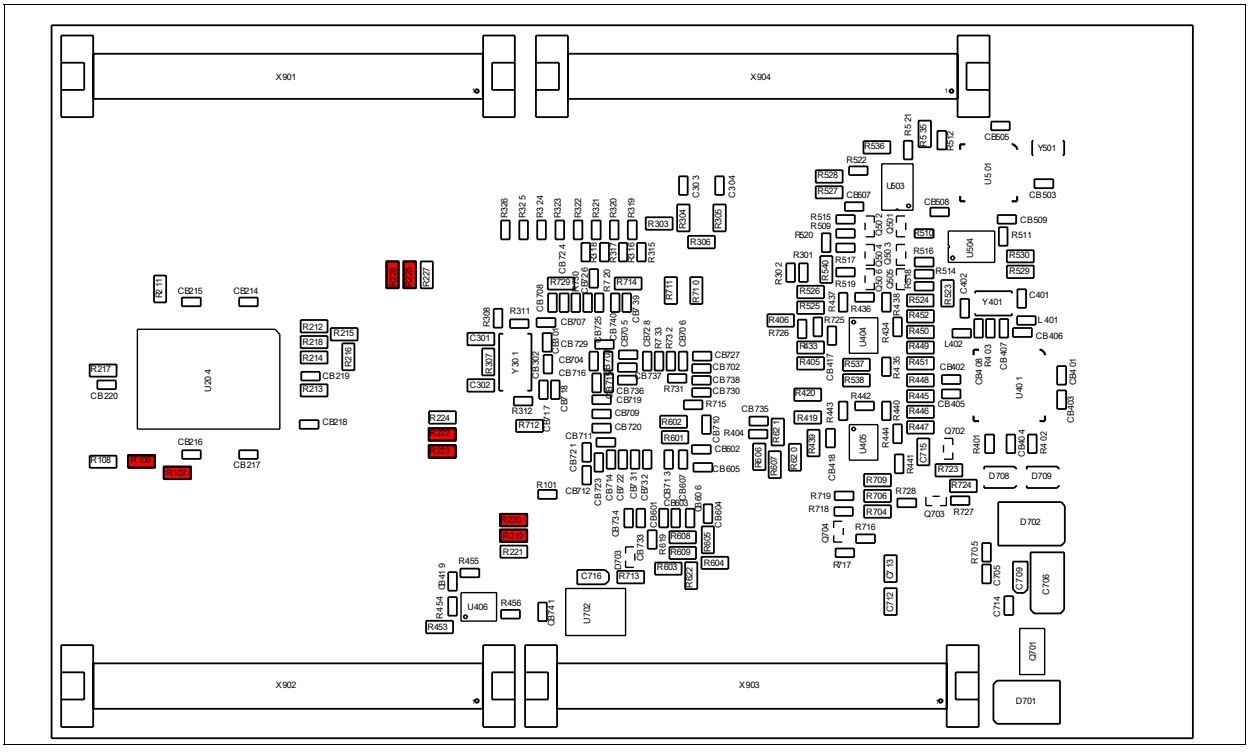


**Figure 4-7 Location of memories resistors on Bottom Side**

# 5 TriBoard Software

## 5.1 Requirements

To install the software from your TriBoard CD you need a PC with Windows95/98/ME, Windows 2000, Windows XP or Windows Vista.

## 5.2 Software Overview

The CD does not contain any tool. For the availablity for Demo Versions of the different Tools, please contact the toolvendor directly (e.g. Tasking, Hitex, Lauterbach, GreenHills, HighTec...). To install tools for compiling and debugging use seperat CD's from Toolvendors. There are also some application notes and software examples. The data sheets of all used parts can be found in the "TriBoard_Components" directory. The manuals for the microcontrollers and the Easy Kit are located in the "Manual" folder. Some useful tools like Acrobat Reader are stored in the "Utilities" directory.

The current Errata Sheet can be found in the directory "Errata Sheet". To make sure you have always the most recent one, please contact your local FAE.

*Note: For more details see the file ReadMe.txt.*

## 5.3 Software Installation

To install tools for the TriCore insert the CD from the Toolvendor and start the file "setup.exe" if the CD is not automatically started. Follow the instructions of the installationprogram.

# 6 Signal Description

For more information about the signals please see the user manuals from TC179X.

**Table 6-1 Power Signals**

| Short Name | Description |
|---|---|
| VCC_IN | Supply Input (5,5V...50V) |
| GND | Ground |
| VDD | Core Supply Voltage (1,5V) |
| VDDP | Port Supply Voltage (3,3V) |
| VDDE | External Bus Supply Voltage (3,3V) |
| VDDFL3 | Flash Supply Voltage (3,3V) |
| VDDESB | Emulation Stand-by SRAM Supply Voltage (1,5V) |
| VDDOSC | Main Oscillator Supply Voltage (1,5V) |
| VDDOSC3 | Main Oscillator Supply Voltage (3,3V) |
| VSSOSC | Main Oscillator Ground |
| VDDPF | E-Ray PLL Supply Voltage (1,5V) |
| VDDPF3 | E-Ray PLL Supply Voltage (3,3V) |
| VSSM | ADC Analog Part Ground |
| VDDM | ADC Analog Part Supply Voltage (5V for TC1797 other 3,3V) |
| VSSMF | FADC Analog Part Ground |
| VDDMF | FADC Analog Part Supply Voltage (3,3V) |
| VDDAF | FADC Analog Part Logic Supply Voltage (1,5V) |
| VAGND0 | ADC0 Reference Ground |
| VAREF0 | ADC0 Reference Voltage (VDDM) |
| VAGND1 | ADC1 Reference Ground |
| VAREF1 | ADC1 Reference Voltage (VDDM) |
| VAREF2 | ADC2 Reference Voltage (VDDM) |
| VFAGND | FADC Reference Ground |
| VFAREF | FADC Reference Voltage (VDDMF) |

**Table 6-2 Reset Signals**

| Short Name | Description |
|---|---|
| /PORST | External Power On Reset |
| /ESR0_/HDRST | Hardware Reset (/ESR0 for TC1797) |

**Table 6-3 Interrupt Signals**

| Short Name | Description |
|---|---|
| /ESR1_/NMI | Non Maskable Interrupt (/ESR1 for TC1797) |
| REQ[0...3] / P1[0...3] | External Trigger Input 0...3 |
| REQ[4...5] / P7[0...1] | External Trigger Input 4...5 |
| REQ[6...7] / P7[4...5] | External Trigger Input 6...7 |

**Table 6-4 Clock Signals**

| Short Name | Description |
|---|---|
| XTAL1 | Crystal Oscillator Input |
| XTAL2 | Crystal Oscillator Output |
| BFCLKO | Burst Mode Flash Clock Output |
| BFCLKI | Burst Mode Flash Clock Input |

**Table 6-5 BUS Signals**

| Short Name | Description |
|---|---|
| D[0...31] | Data Bus |
| A[0...23] | Address Bus |

**Table 6-6 BUS Control Signals**

| Short Name | Description |
|---|---|
| /CS[0...3] | Chip Selects |
| /CSCOMB | Combined Chip Select Output |
| /BC[0...3] | Byte Controls |
| /RD | Read |
| /WR | Write |
| MR/W | Motorola-style Read/Write |

**Table 6-6 BUS Control Signals**

| | |
|---|---|
| /BAA | Burst address advance output |
| /ADV | Address Valid |
| /BREQ | Bus Request Output |
| /HOLD | Hold Request Input |
| /HLDA | Hold Acknowledge |
| /WAIT | Wait Input |

**Table 6-7 Debug Signals**

| Short Name | Description |
|---|---|
| /TRST | Test Reset |
| TCLK | Test Clock |
| TMS | Test Mode Select |
| TDI | Test Data Input |
| TDO | Test Data Output |
| TRCLK | Trace Clock for OCDS Level 2 |
| TESTMODE | Test Mode Select Input |
| /BRKIN | TriCore Breakpoint Input |
| BYPASS | Bypass PLL |
| /BRKOUT | TriCore Breakpoint Output |

**Table 6-8 Peripheral Signals**

| Short Name | Description |
|---|---|
| P5.0 | Receive Data ASC0 |
| P5.1 | Transmit Data ASC0 |
| P5.2 | Receive Data ASC1 |
| P5.3 | Transmit Data ASC1 |
| SCLK0 / P10.3 | Clock Line SSC0 |
| MRST0 / P10.0 | Master Receive / Slave Transmit SSC0 |
| MTSR0 / P10.1 | Master Transmit / Slave Receive SSC0 |
| SLSI0 / P10.2 | Slave Select Input SSC0 |
| SLSO0 / P10.4 | Slave Select Output 0 (SSC0) |
| SLSO1 / P10.5 | Slave Select Output 1 (SSC0) |

**Table 6-8 Peripheral Signals**

| | |
|---|---|
| P6.6 | Clock Line SSC1 |
| P6.5 | Master Receive / Slave Transmit SSC1 |
| P6.4 | Master Transmit / Slave Receive SSC1 |
| P6.7 | Slave Select Input SSC1 |
| P2[2..7] | Slave Select Output 2..7 |
| P6.9 | CAN Transmitter Output 0 |
| P6.8 | CAN Receiver Input 0 |
| P6.11 | CAN Transmitter Output 1 |
| P6.10 | CAN Receiver Input 1 |
| P6.13 | CAN Transmitter Output 2 |
| P6.12 | CAN Receiver Input 2 |
| P6.15 | CAN Transmitter Output 3 |
| P6.14 | CAN Receiver Input 3 |
| P0 [0...7] | General Purpose I/O Port 0 (HWCFG for TC1797 else SWOPT) |
| P0 [8...15] | General Purpose I/O Port 0 (SWOPT if not TC1797) |
| P1[12...15] | General Purpose I/O Port 1.12...1.15 |
| P2[8...15] | General Pupose I/O Port 2 |
| P3[0...15] | General Pupose I/O Port 3 |
| P4[0...15] | General Pupose I/O Port 4 |
| P9[0...8] | General Pupose I/O Port 9 |
| AN[0...43] | Analog Inputs |
| P7[2...3] | ADC0 External Multiplexer Control |
| P7[6...7] | ADC1 External Multiplexer Control |
| FCLP0A / P5.11 | MSC0 differential driver clock output positive A |
| FCLN0 / P5.10 | MSC0 differential driver clock output negative |
| SOP0A / P5.9 | MSC0 differential driver serial data output positive A |
| SON0 / P5.8 | MSC0 differential driver serial data output negative |
| EN00 / P5.4 | MSC0 device select output 0 |
| SDI0 / P5.5 | MSC0 serial data input |
| P5.15 | MSC1 differential driver clock output positive A |
| P5.14 | MSC1 differential driver clock output negative |

**Table 6-8 Peripheral Signals**

| | |
|---|---|
| P5.13 | MSC1 differential driver serial data output positive A |
| P5.12 | MSC1 differential driver serial data output negative |
| P5.6 | MSC1 device select output 0 |
| P5.7 | MSC1 serial data input |
| P1.8 | MLI0 receive channel clock |
| P1.9 | MLI0 receive channel ready output |
| P1.10 | MLI0 receive channel valid input |
| P1.11 | MLI0 receive channel data input |
| P1.4 | MLI0 transmit channel clock |
| P1.5 | MLI0 transmit channel ready input |
| P1.6 | MLI0 transmit channel valid output |
| P1.7 | MLI0 transmit channel data output |
| P8.4 | MLI1 receive channel clock |
| P8.5 | MLI1 receive channel ready output |
| P8.6 | MLI1 receive channel valid input |
| P8.7 | MLI1 receive channel data input |
| P8.0 | MLI1 transmit channel clock |
| P8.1 | MLI1 transmit channel ready input |
| P8.2 | MLI1 transmit channel valid output |
| P8.3 | MLI1 transmit channel data output |
| P10[0...3] / P9[9..12] | General Purpose I/O Port 10 (used as HWCFG not for TC1797) |

# 7 Connector Pin Assignment

The TriBoard will be shipped with four male (plug) connectors on top layer and four female (socket) connectors on bottom layer. The default connectors are 80-pol. Board to Board connectors from Samtec:

http://www.samtec.com

Plug:

FTSH-140-02-L-DV-ES-A

Socket:

FLE-140-01-G-DV-A

Alternative there can be used the Board to Board System from Robinson Nugent:

http://www.robinsonnugent.com

Plug:

P50L-80P-AS-TGF

Socket:

P50L-80S-AS-TGF

*Note: All connectors are pincompatible with the previous versions of TriBoard TC179X.*

## 7.1 TC1797 Connector / Top View

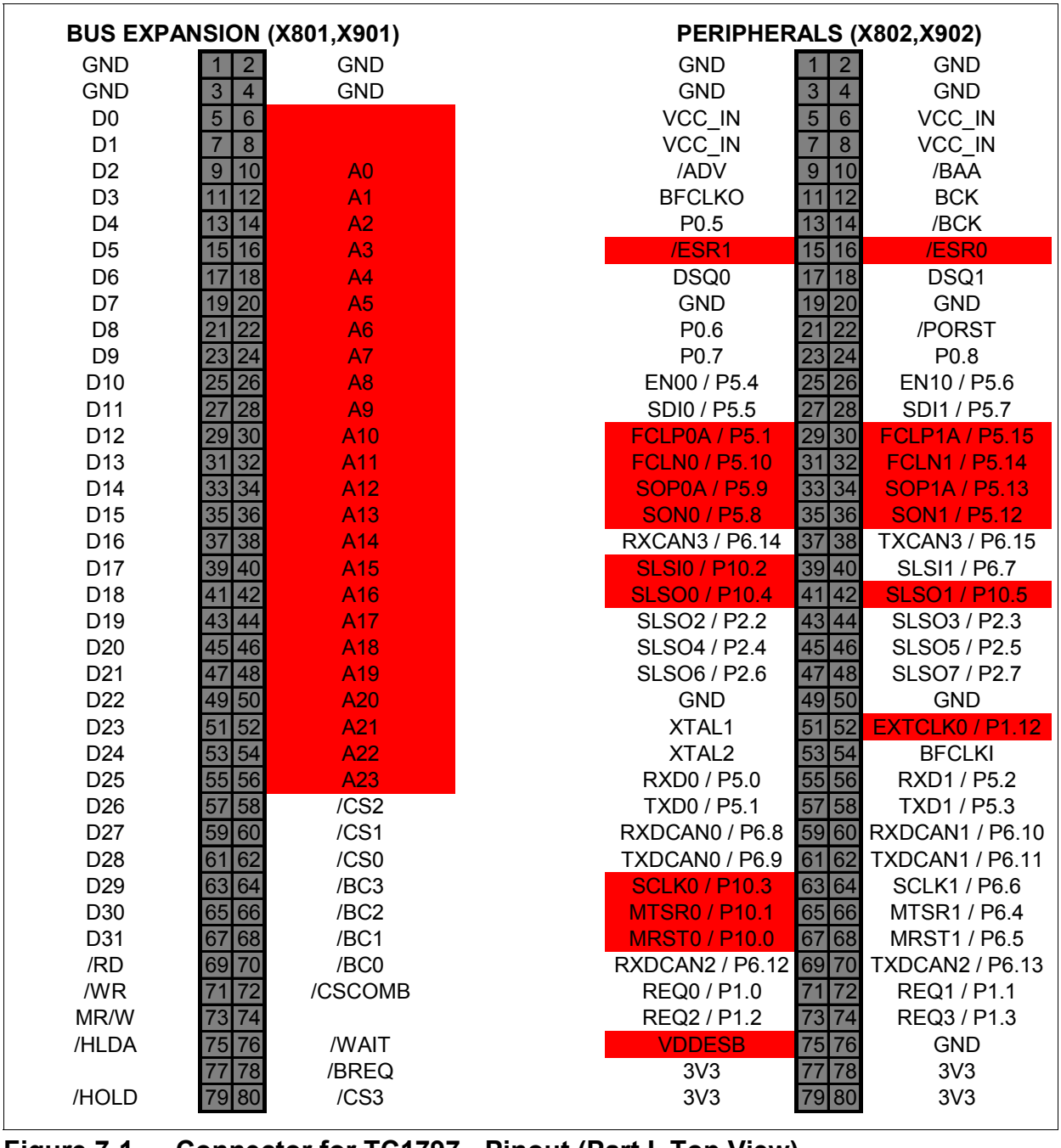


**Figure 7-1 Connector for TC1797 - Pinout (Part I, Top View)**

*Note: The red marked fields have different names than the other TC179X devices, but the functionality is the same as on the other TC179X devices.*

**ADC (X803, X903)**

| | | | | | |
|---|---|---|---|---|---|
| VSSM | 1 | 2 | VSSM | | |
| VSSM | 3 | 4 | VSSM | | |
| AN0 | 5 | 6 | AN16 | | |
| AN1 | 7 | 8 | AN17 | | |
| AN2 | 9 | 10 | AN18 | | |
| AN3 | 11 | 12 | AN19 | | |
| AN4 | 13 | 14 | AN20 | | |
| AN5 | 15 | 16 | AN21 | | |
| AN6 | 17 | 18 | AN22 | | |
| AN7 | 19 | 20 | AN23 | | |
| AN8 | 21 | 22 | AN24 | | |
| AN9 | 23 | 24 | AN25 | | |
| AN10 | 25 | 26 | AN26 | | |
| AN11 | 27 | 28 | AN27 | | |
| AN12 | 29 | 30 | AN28 | | |
| AN13 | 31 | 32 | AN29 | | |
| AN14 | 33 | 34 | AN30 | | |
| AN15 | 35 | 36 | AN31 | | |
| VSSM | 37 | 38 | VSSMF | | |
| VDDM | 39 | 40 | VDDMF | | |
| VSSFAREF | 41 | 42 | VDDFAREF | | |
| VSSAREF0 | 43 | 44 | VSSAREF1 | | |
| VDDAREF0 | 45 | 46 | VDDAREF1 | | |
| VSSM | 47 | 48 | VSSM | | |
| AN32 | 49 | 50 | AN38 | | |
| AN33 | 51 | 52 | AN39 | | |
| AN34 | 53 | 54 | AN40 | | |
| AN35 | 55 | 56 | AN41 | | |
| AN36 | 57 | 58 | AN42 | | |
| AN37 | 59 | 60 | AN43 | | |
| VSSM | 61 | 62 | VSSM | | |
| P0.8 | 63 | 64 | P0.9 | | |
| P0.10 | 65 | 66 | P0.11 | | |
| P0.12 | 67 | 68 | P0.13 | | |
| 3V3 | 69 | 70 | 3V3 | | |
| AD0EMUX0 / P7.2 | 71 | 72 | AD1EMUX0 / P7.6 | | |
| AD0EMUX1 / P7.3 | 73 | 74 | AD1EMUX1 / P7.7 | | |
| REQ5 / P7.1 | 75 | 76 | P0.14 | | |
| P0.15 | 77 | 78 | REQ4 / P7.0 | | |
| REQ7 / P7.5 | 79 | 80 | REQ6 / P7.4 | | |

**GPTA / MLI (X804,X904)**

| | | | |
|---|---|---|---|
| GND | 1 | 2 | GND |
| GND | 3 | 4 | GND |
| GPTA0 / P2.8 | 5 | 6 | GPTA32 / P4.8 |
| GPTA1 / P2.9 | 7 | 8 | GPTA33 / P4.9 |
| GPTA2 / P2.10 | 9 | 10 | GPTA34 / P4.10 |
| GPTA3 / P2.11 | 11 | 12 | GPTA35 / P4.11 |
| GPTA4 / P2.12 | 13 | 14 | GPTA36 / P4.12 |
| GPTA5 / P2.13 | 15 | 16 | GPTA37 / P4.13 |
| GPTA6 / P2.14 | 17 | 18 | GPTA38 / P4.14 |
| GPTA7 / P2.15 | 19 | 20 | GPTA39 / P4.15 |
| GPTA8 / P3.0 | 21 | 22 | GPTA40 / P8.0 |
| GPTA9 / P3.1 | 23 | 24 | GPTA41 / P8.1 |
| GPTA10 / P3.2 | 25 | 26 | GPTA42 / P8.2 |
| GPTA11 / P3.3 | 27 | 28 | GPTA43 / P8.3 |
| GPTA12 / P3.4 | 29 | 30 | GPTA44 / P8.4 |
| GPTA13 / P3.5 | 31 | 32 | GPTA45 / P8.5 |
| GPTA14 / P3.6 | 33 | 34 | GPTA46 / P8.6 |
| GPTA15 / P3.7 | 35 | 36 | GPTA47 / P8.7 |
| GPTA16 / P3.8 | 37 | 38 | GPTA48 / P9.0 |
| GPTA17 / P3.9 | 39 | 40 | GPTA49 / P9.1 |
| GPTA18 / P3.10 | 41 | 42 | GPTA50 / P9.2 |
| GPTA19 / P3.11 | 43 | 44 | GPTA51 / P9.3 |
| GPTA20 / P3.12 | 45 | 46 | GPTA52 / P9.4 |
| GPTA21 / P3.13 | 47 | 48 | GPTA53 / P9.5 |
| GPTA22 / P3.14 | 49 | 50 | GPTA54 / P9.6 |
| GPTA23 / P3.15 | 51 | 52 | GPTA55 / P9.7 |
| GPTA24 / P4.0 | 53 | 54 | P9.8 |
| GPTA25 / P4.1 | 55 | 56 | P9.9 |
| GPTA26 / P4.2 | 57 | 58 | EMGSTOP / P9.10 |
| GPTA27 / P4.3 | 59 | 60 | P9.11 |
| GPTA28 / P4.4 | 61 | 62 | P9.12 |
| GPTA29 / P4.5 | 63 | 64 | P1.13 |
| GPTA30 / P4.6 | 65 | 66 | P1.14 |
| GPTA31 / P4.7 | 67 | 68 | P1.15 |
| TCLK0 / P1.4 | 69 | 70 | RDATA0 / P1.11 |
| TREADY0 / P1.5 | 71 | 72 | RVALID0 / P1.10 |
| TVALID0 / P1.6 | 73 | 74 | RREADY0 / P1.9 |
| TDATA0 / P1.7 | 75 | 76 | RCLK0 / P1.8 |
| 3V3 | 77 | 78 | 3V3 |
| 3V3 | 79 | 80 | 3V3 |

**Figure 7-2 Connector for TC179X - Pinout (Part II, Top View)**

*Note: The red marked fields have different names than the other TC179X devices, but the functionality is the same as on the other TC179X devices.*

## 7.2 Other TC179X Connector / Top View

**BUS EXPANSION (X801,X901)**

| | | | |
|---|---|---|---|
| GND | 1 | 2 | GND |
| GND | 3 | 4 | GND |
| D0 | 5 | 6 | A0 |
| D1 | 7 | 8 | A1 |
| D2 | 9 | 10 | A2 |
| D3 | 11 | 12 | A3 |
| D4 | 13 | 14 | A4 |
| D5 | 15 | 16 | A5 |
| D6 | 17 | 18 | A6 |
| D7 | 19 | 20 | A7 |
| D8 | 21 | 22 | A8 |
| D9 | 23 | 24 | A9 |
| D10 | 25 | 26 | A10 |
| D11 | 27 | 28 | A11 |
| D12 | 29 | 30 | A12 |
| D13 | 31 | 32 | A13 |
| D14 | 33 | 34 | A14 |
| D15 | 35 | 36 | A15 |
| D16 | 37 | 38 | A16 |
| D17 | 39 | 40 | A17 |
| D18 | 41 | 42 | A18 |
| D19 | 43 | 44 | A19 |
| D20 | 45 | 46 | A20 |
| D21 | 47 | 48 | A21 |
| D22 | 49 | 50 | A22 |
| D23 | 51 | 52 | A23 |
| D24 | 53 | 54 | |
| D25 | 55 | 56 | |
| D26 | 57 | 58 | /CS2 |
| D27 | 59 | 60 | /CS1 |
| D28 | 61 | 62 | /CS0 |
| D29 | 63 | 64 | /BC3 |
| D30 | 65 | 66 | /BC2 |
| D31 | 67 | 68 | /BC1 |
| /RD | 69 | 70 | /BC0 |
| /WR | 71 | 72 | /CSCOMB |
| MR/W | 73 | 74 | |
| /HLDA | 75 | 76 | /WAIT |
| | 77 | 78 | /BREQ |
| /HOLD | 79 | 80 | /CS3 |

**PERIPHERALS (X802,X902)**

| | | | |
|---|---|---|---|
| GND | 1 | 2 | GND |
| GND | 3 | 4 | GND |
| VCC_IN | 5 | 6 | VCC_IN |
| VCC_IN | 7 | 8 | VCC_IN |
| /ADV | 9 | 10 | /BAA |
| BFCLKO | 11 | 12 | BCK |
| P0.5 | 13 | 14 | /BCK |
| /NMI | 15 | 16 | /HDRST |
| DSQ0 | 17 | 18 | DSQ1 |
| GND | 19 | 20 | GND |
| P0.6 | 21 | 22 | /PORST |
| P0.7 | 23 | 24 | P0.8 |
| EN00 / P5.4 | 25 | 26 | EN10 / P5.6 |
| SDI0 / P5.5 | 27 | 28 | SDI1 / P5.7 |
| FCLP0A | 29 | 30 | FCLP1A |
| FCLN0 | 31 | 32 | FCLN1 |
| SOP0A | 33 | 34 | SOP1A |
| SON0 | 35 | 36 | SON1 |
| RXCAN3 / P6.14 | 37 | 38 | TXCAN3 / P6.15 |
| SLSI0 | 39 | 40 | SLSI1 / P6.7 |
| SLSO0 | 41 | 42 | SLSO1 |
| SLSO2 / P2.2 | 43 | 44 | SLSO3 / P2.3 |
| SLSO4 / P2.4 | 45 | 46 | SLSO5 / P2.5 |
| SLSO6 / P2.6 | 47 | 48 | SLSO7 / P2.7 |
| GND | 49 | 50 | GND |
| XTAL1 | 51 | 52 | SYSCLK / P1.12 |
| XTAL2 | 53 | 54 | BFCLKI |
| RXD0 / P5.0 | 55 | 56 | RXD1 / P5.2 |
| TXD0 / P5.1 | 57 | 58 | TXD1 / P5.3 |
| RXDCAN0 / P6.8 | 59 | 60 | RXDCAN1 / P6.10 |
| TXDCAN0 / P6.9 | 61 | 62 | TXDCAN1 / P6.11 |
| SCLK0 | 63 | 64 | SCLK1 / P6.6 |
| MTSR0 | 65 | 66 | MTSR1 / P6.4 |
| MRST0 | 67 | 68 | MRST1 / P6.5 |
| RXDCAN2 / P6.12 | 69 | 70 | TXDCAN2 / P6.13 |
| REQ0 / P1.0 | 71 | 72 | REQ1 / P1.1 |
| REQ2 / P1.2 | 73 | 74 | REQ3 / P1.3 |
| VDDSBRAM | 75 | 76 | GND |
| 3V3 | 77 | 78 | 3V3 |
| 3V3 | 79 | 80 | 3V3 |

**Figure 7-3 Connector for other TC179X - Pinout (Part I, Top View)**

*Note: The red marked fields have different names than the TC1797 device, but the functionality is the same as on the TC1797 device.*

| ADC (X803, X903) | | | | GPTA / MLI (X804,X904) | | | |
|---|---|---|---|---|---|---|---|
| VSSM | 1 | 2 | VSSM | GND | 1 | 2 | GND |
| VSSM | 3 | 4 | VSSM | GND | 3 | 4 | GND |
| AN0 | 5 | 6 | AN16 | GPTA0 / P2.8 | 5 | 6 | GPTA32 / P4.8 |
| AN1 | 7 | 8 | AN17 | GPTA1 / P2.9 | 7 | 8 | GPTA33 / P4.9 |
| AN2 | 9 | 10 | AN18 | GPTA2 / P2.10 | 9 | 10 | GPTA34 / P4.10 |
| AN3 | 11 | 12 | AN19 | GPTA3 / P2.11 | 11 | 12 | GPTA35 / P4.11 |
| AN4 | 13 | 14 | AN20 | GPTA4 / P2.12 | 13 | 14 | GPTA36 / P4.12 |
| AN5 | 15 | 16 | AN21 | GPTA5 / P2.13 | 15 | 16 | GPTA37 / P4.13 |
| AN6 | 17 | 18 | AN22 | GPTA6 / P2.14 | 17 | 18 | GPTA38 / P4.14 |
| AN7 | 19 | 20 | AN23 | GPTA7 / P2.15 | 19 | 20 | GPTA39 / P4.15 |
| AN8 | 21 | 22 | AN24 | GPTA8 / P3.0 | 21 | 22 | GPTA40 / P8.0 |
| AN9 | 23 | 24 | AN25 | GPTA9 / P3.1 | 23 | 24 | GPTA41 / P8.1 |
| AN10 | 25 | 26 | AN26 | GPTA10 / P3.2 | 25 | 26 | GPTA42 / P8.2 |
| AN11 | 27 | 28 | AN27 | GPTA11 / P3.3 | 27 | 28 | GPTA43 / P8.3 |
| AN12 | 29 | 30 | AN28 | GPTA12 / P3.4 | 29 | 30 | GPTA44 / P8.4 |
| AN13 | 31 | 32 | AN29 | GPTA13 / P3.5 | 31 | 32 | GPTA45 / P8.5 |
| AN14 | 33 | 34 | AN30 | GPTA14 / P3.6 | 33 | 34 | GPTA46 / P8.6 |
| AN15 | 35 | 36 | AN31 | GPTA15 / P3.7 | 35 | 36 | GPTA47 / P8.7 |
| VSSM | 37 | 38 | VSSMF | GPTA16 / P3.8 | 37 | 38 | GPTA48 / P9.0 |
| VDDM | 39 | 40 | VDDMF | GPTA17 / P3.9 | 39 | 40 | GPTA49 / P9.1 |
| VSSFAREF | 41 | 42 | VDDFAREF | GPTA18 / P3.10 | 41 | 42 | GPTA50 / P9.2 |
| VSSAREF0 | 43 | 44 | VSSAREF1 | GPTA19 / P3.11 | 43 | 44 | GPTA51 / P9.3 |
| VDDAREF0 | 45 | 46 | VDDAREF1 | GPTA20 / P3.12 | 45 | 46 | GPTA52 / P9.4 |
| VSSM | 47 | 48 | VSSM | GPTA21 / P3.13 | 47 | 48 | GPTA53 / P9.5 |
| AN32 | 49 | 50 | AN38 | GPTA22 / P3.14 | 49 | 50 | GPTA54 / P9.6 |
| AN33 | 51 | 52 | AN39 | GPTA23 / P3.15 | 51 | 52 | GPTA55 / P9.7 |
| AN34 | 53 | 54 | AN40 | GPTA24 / P4.0 | 53 | 54 | P9.8 |
| AN35 | 55 | 56 | AN41 | GPTA25 / P4.1 | 55 | 56 | P10.0 |
| AN36 | 57 | 58 | AN42 | GPTA26 / P4.2 | 57 | 58 | EMGSTOP / P10.1 |
| AN37 | 59 | 60 | AN43 | GPTA27 / P4.3 | 59 | 60 | P10.2 |
| VSSM | 61 | 62 | VSSM | GPTA28 / P4.4 | 61 | 62 | P10.3 |
| P0.8 | 63 | 64 | P0.9 | GPTA29 / P4.5 | 63 | 64 | P1.13 |
| P0.10 | 65 | 66 | P0.11 | GPTA30 / P4.6 | 65 | 66 | P1.14 |
| P0.12 | 67 | 68 | P0.13 | GPTA31 / P4.7 | 67 | 68 | P1.15 |
| 3V3 | 69 | 70 | 3V3 | TCLK0 / P1.4 | 69 | 70 | RDATA0 / P1.11 |
| AD0EMUX0 / P7.2 | 71 | 72 | AD1EMUX0 / P7.6 | TREADY0 / P1.5 | 71 | 72 | RVALID0 / P1.10 |
| AD0EMUX1 / P7.3 | 73 | 74 | AD1EMUX1 / P7.7 | TVALID0 / P1.6 | 73 | 74 | RREADY0 / P1.9 |
| REQ5 / P7.1 | 75 | 76 | P0.14 | TDATA0 / P1.7 | 75 | 76 | RCLK0 / P1.8 |
| P0.15 | 77 | 78 | REQ4 / P7.0 | 3V3 | 77 | 78 | 3V3 |
| REQ7 / P7.5 | 79 | 80 | REQ6 / P7.4 | 3V3 | 79 | 80 | 3V3 |

**Figure 7-4 Connector for other TC179X - Pinout (Part II, Top View)**

*Note: The red marked fields have different names than the TC1797 device, but the functionality is the same as on the TC1797 device.*

## 7.3 Power connector pinout

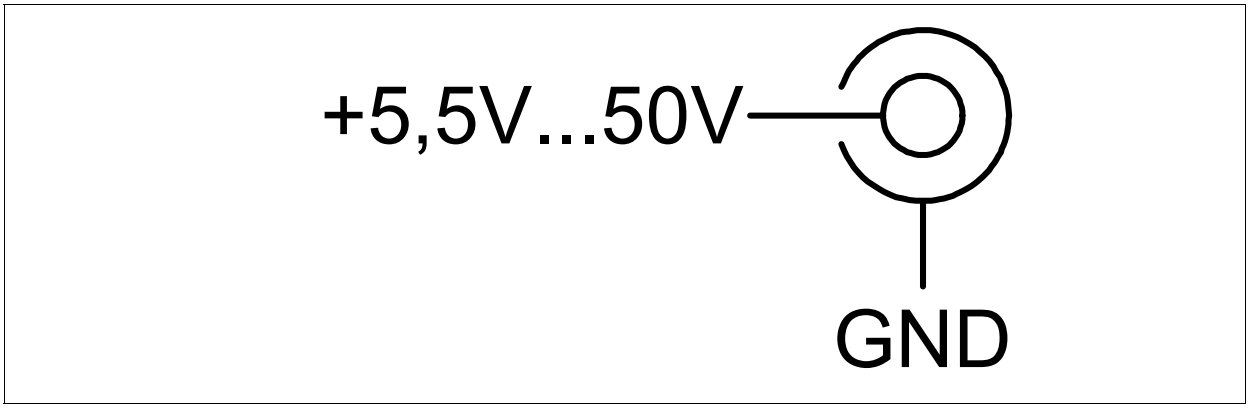


**Figure 7-5 Power connector pinout**

## 7.4 USB connector pinout

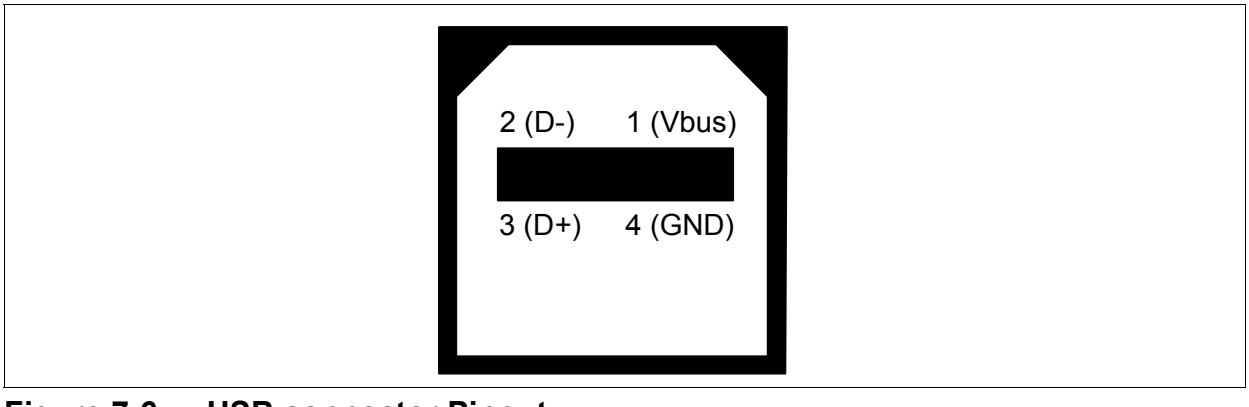


**Figure 7-6 USB connector Pinout**

## 7.5 Flexray Pinout

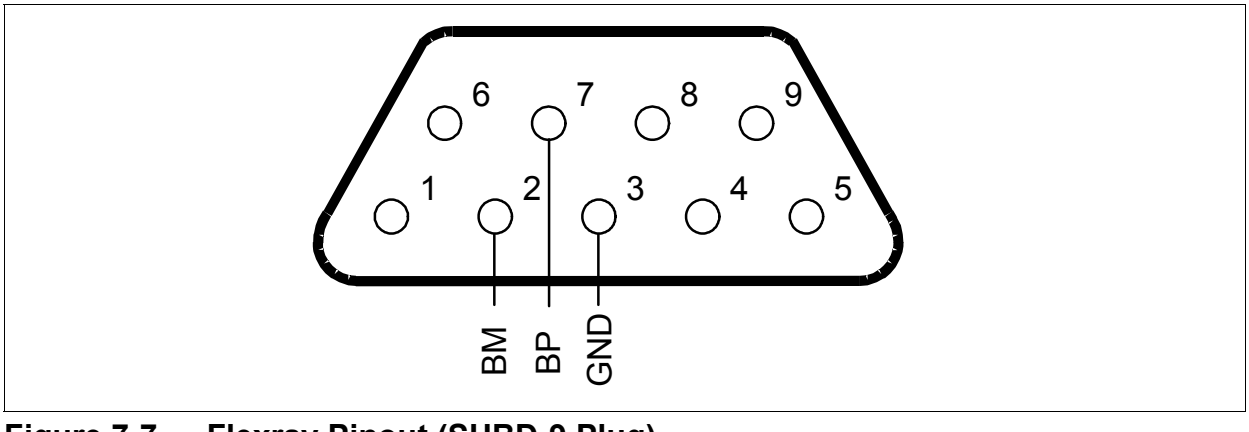


**Figure 7-7 Flexray Pinout (SUBD-9 Plug)**

## 7.6 CAN connector pinout

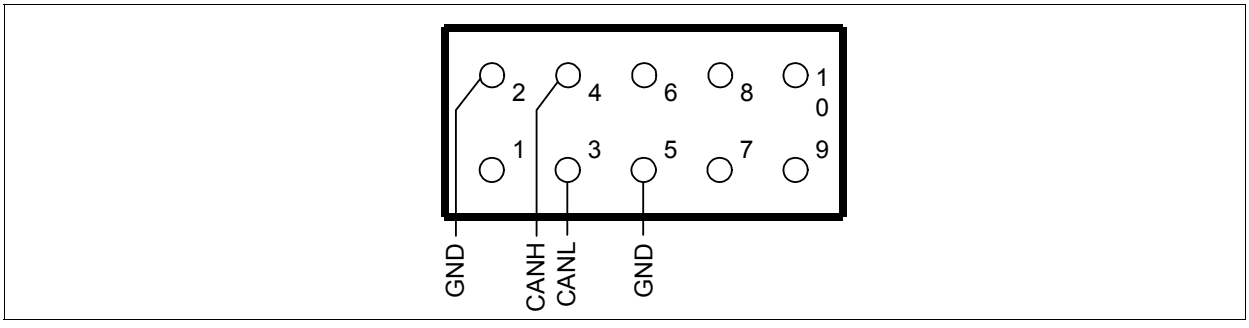


**Figure 7-8 CAN connector pinout (IDC10)**

## 7.7 OCDS connector pinout

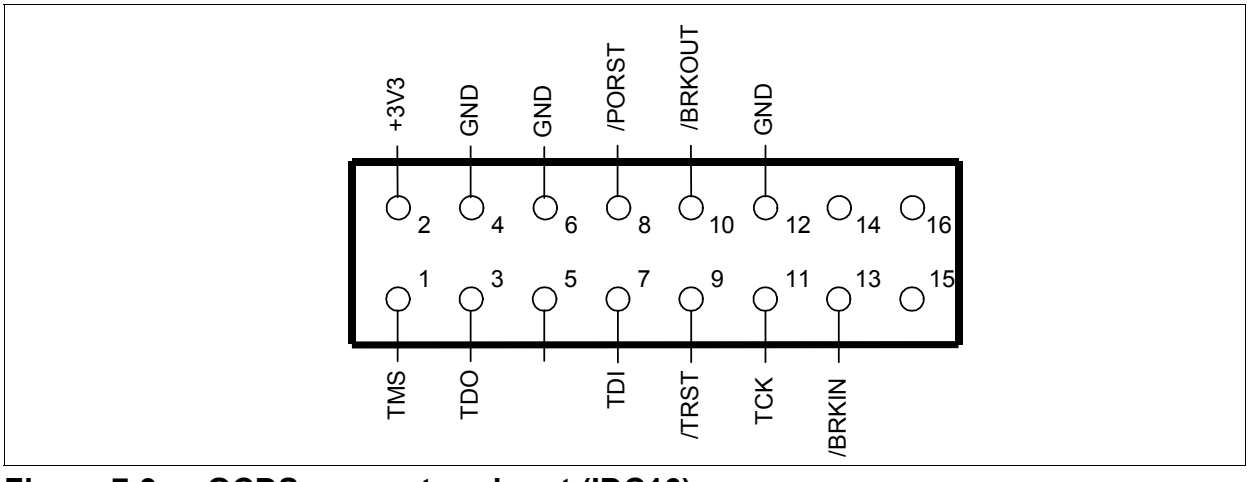


**Figure 7-9 OCDS connector pinout (IDC16)**

## 7.8 DAP connector pinout (only with TC1797)

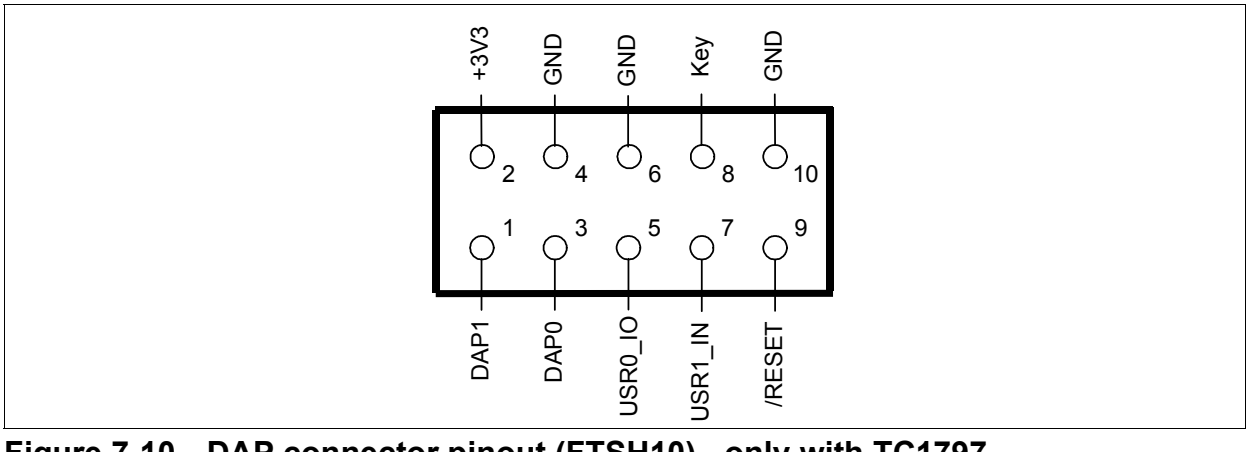


**Figure 7-10 DAP connector pinout (FTSH10) - only with TC1797**

# 8 Schematic and Layout

## 8.1 Schematic

### 8.1.1 New and changes on schematic version V4.0

- Changes for TC1797 utilization
- Add Flexray support (direct or via SAK-CIC310)
- Add 7 toogle LEDs
- Change Power Supply to TLE7368G
- Remove On Board Parallel Wiggler and ASC connectors
- Add MiniWiggler and ASC via USB
- Remove OCDS2 connector

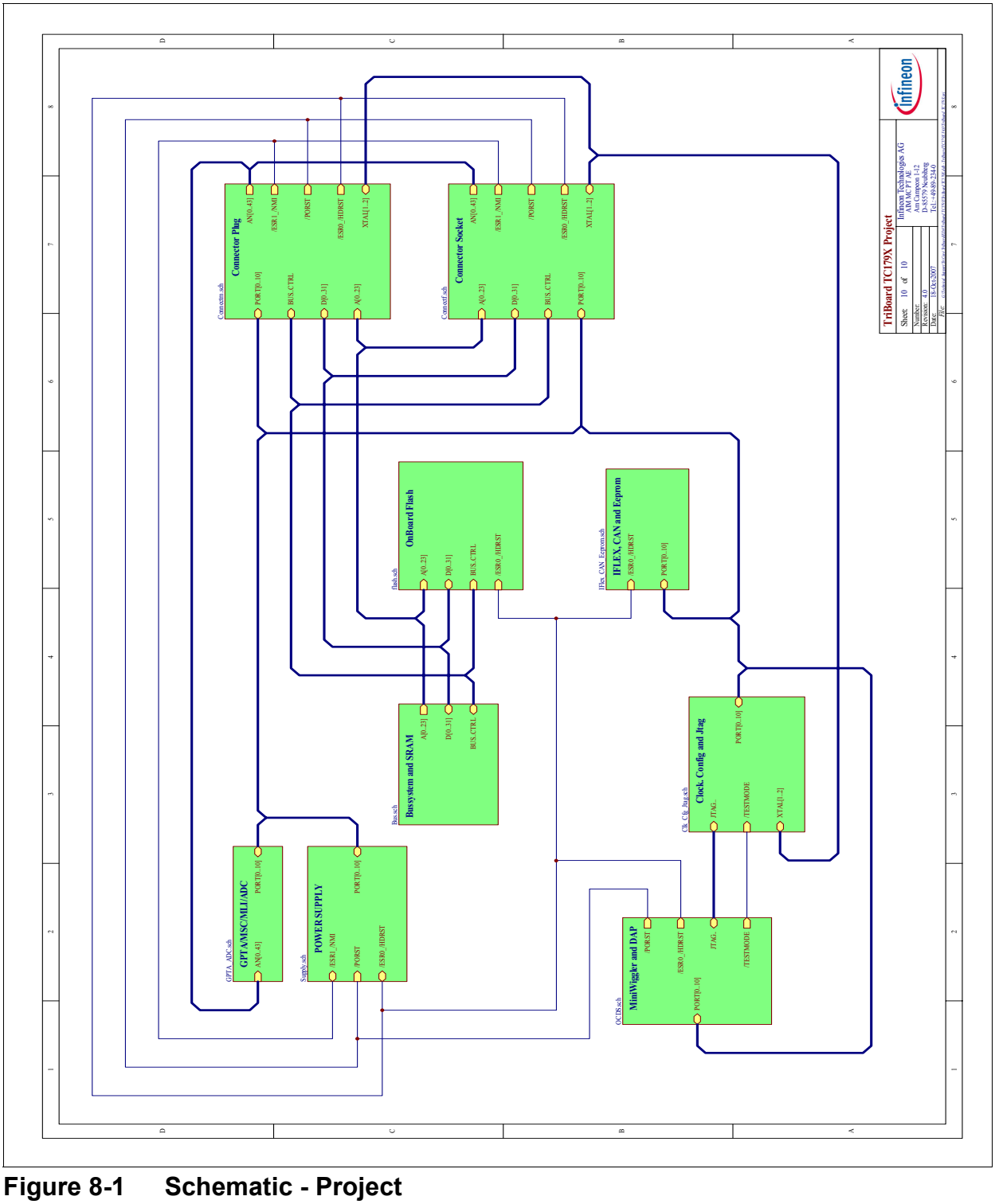


**Figure 8-1 Schematic - Project**

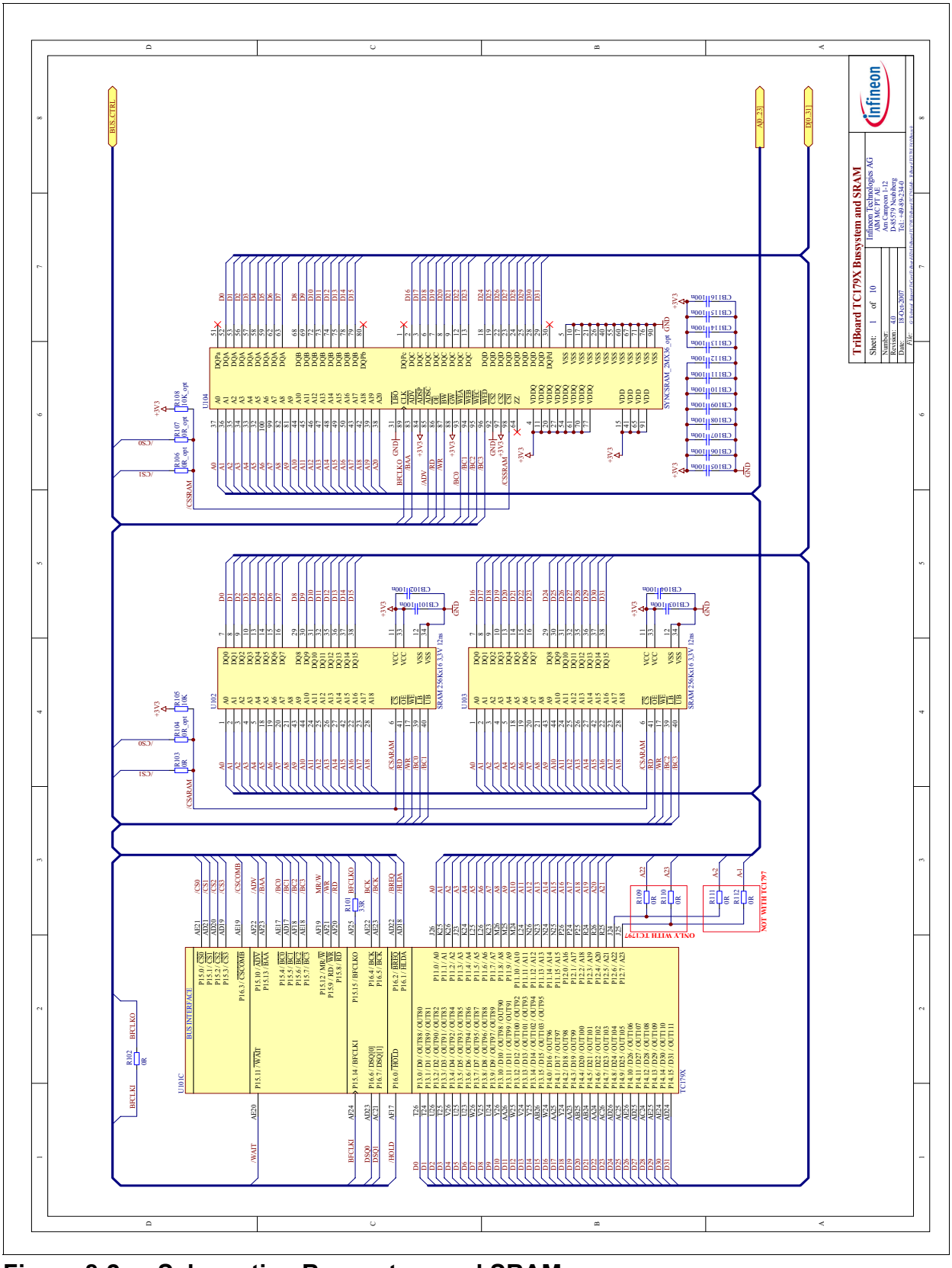


**Figure 8-2 Schematic - Bussystem and SRAM**

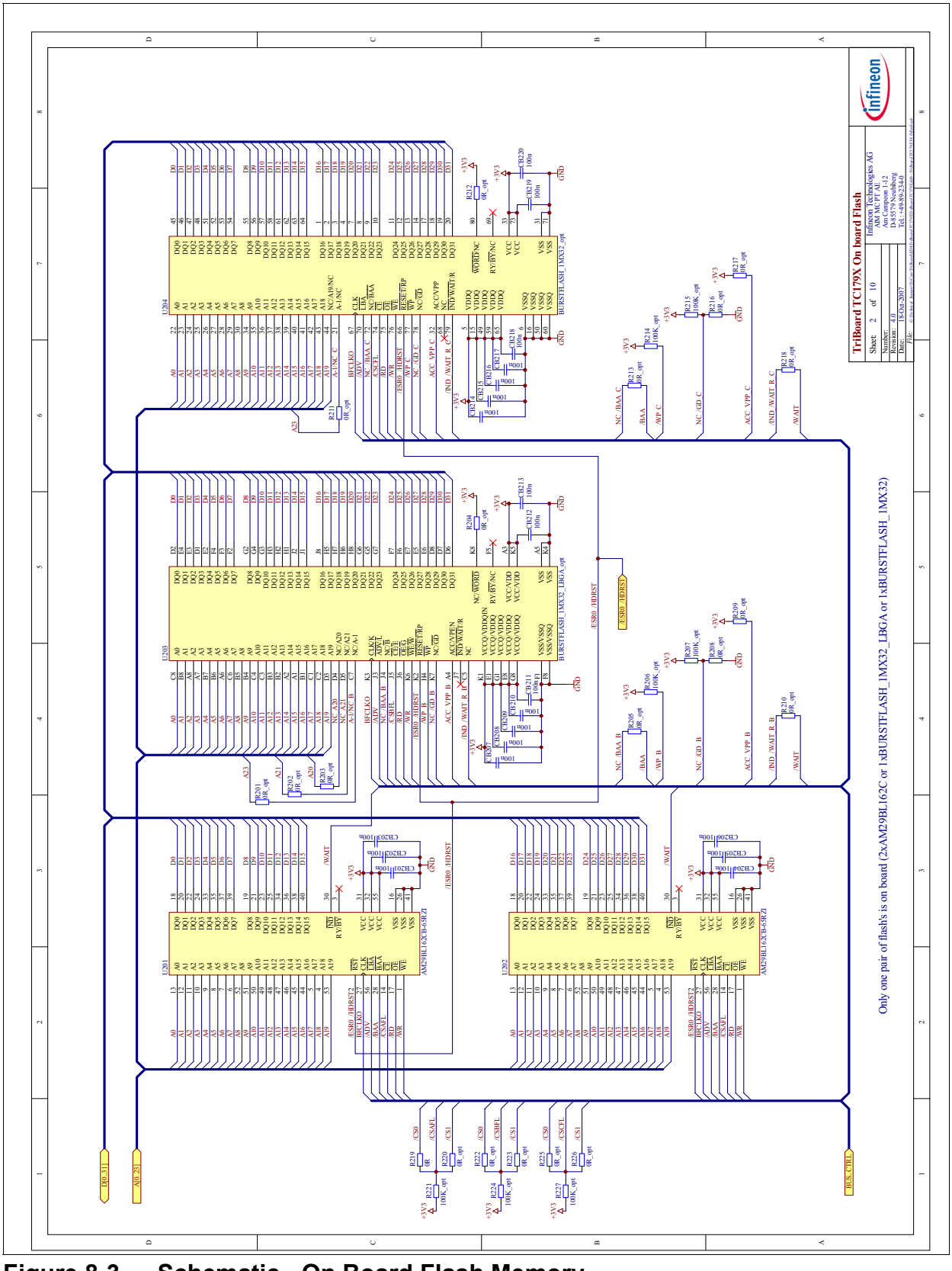


**Figure 8-3 Schematic - On Board Flash Memory**

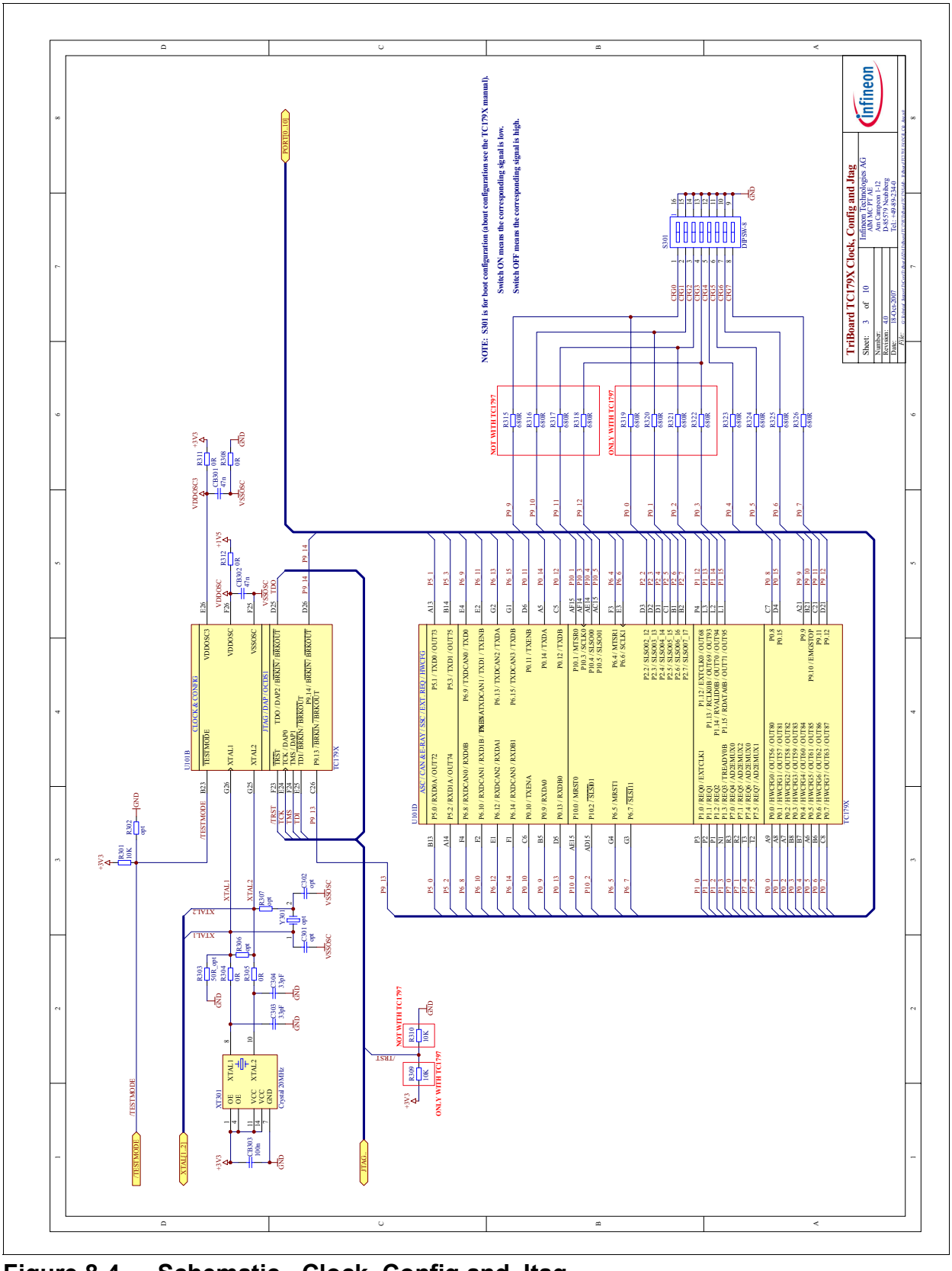


**Figure 8-4 Schematic - Clock, Config and Jtag**

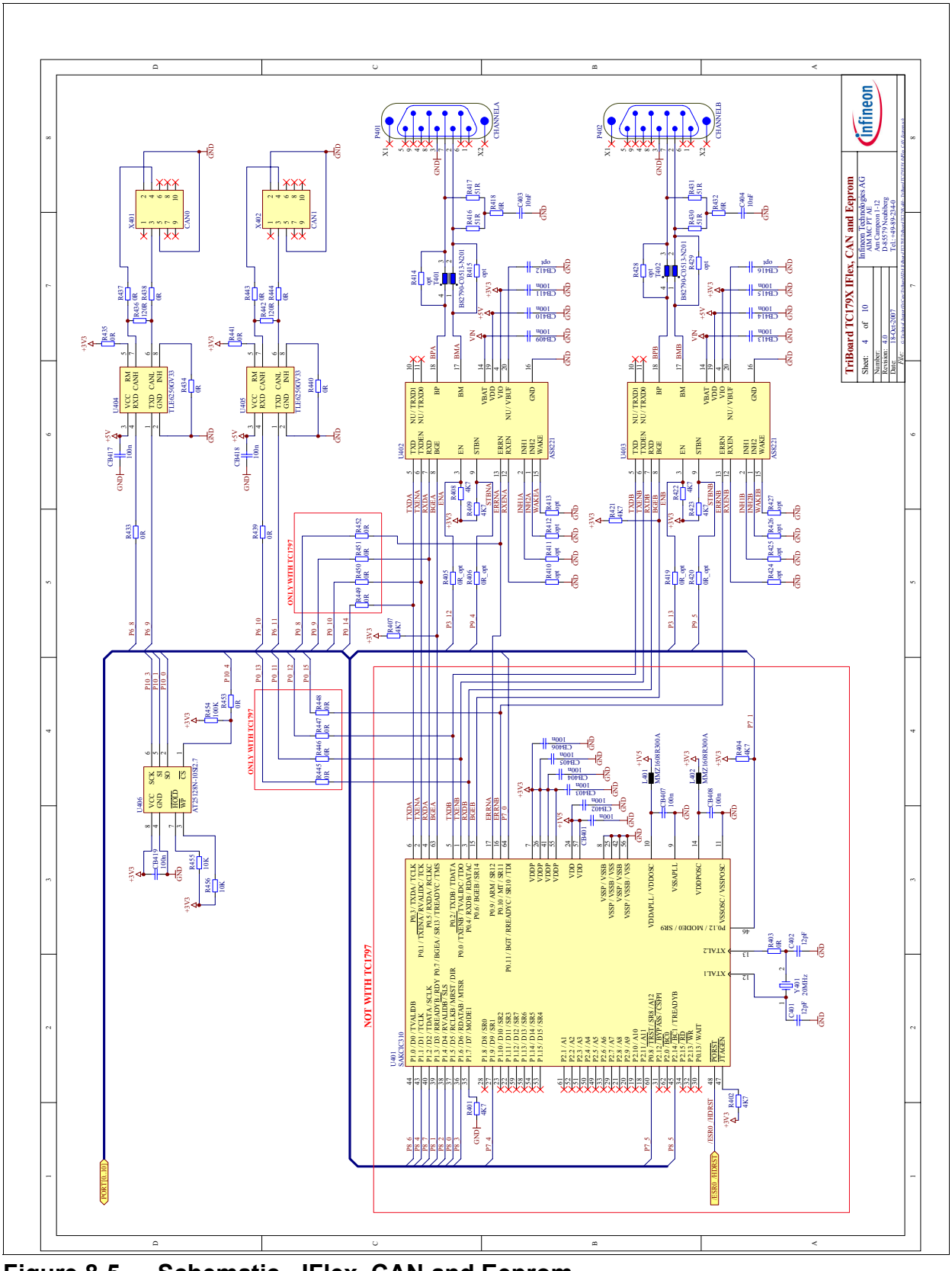


**Figure 8-5 Schematic - IFlex, CAN and Eeprom**

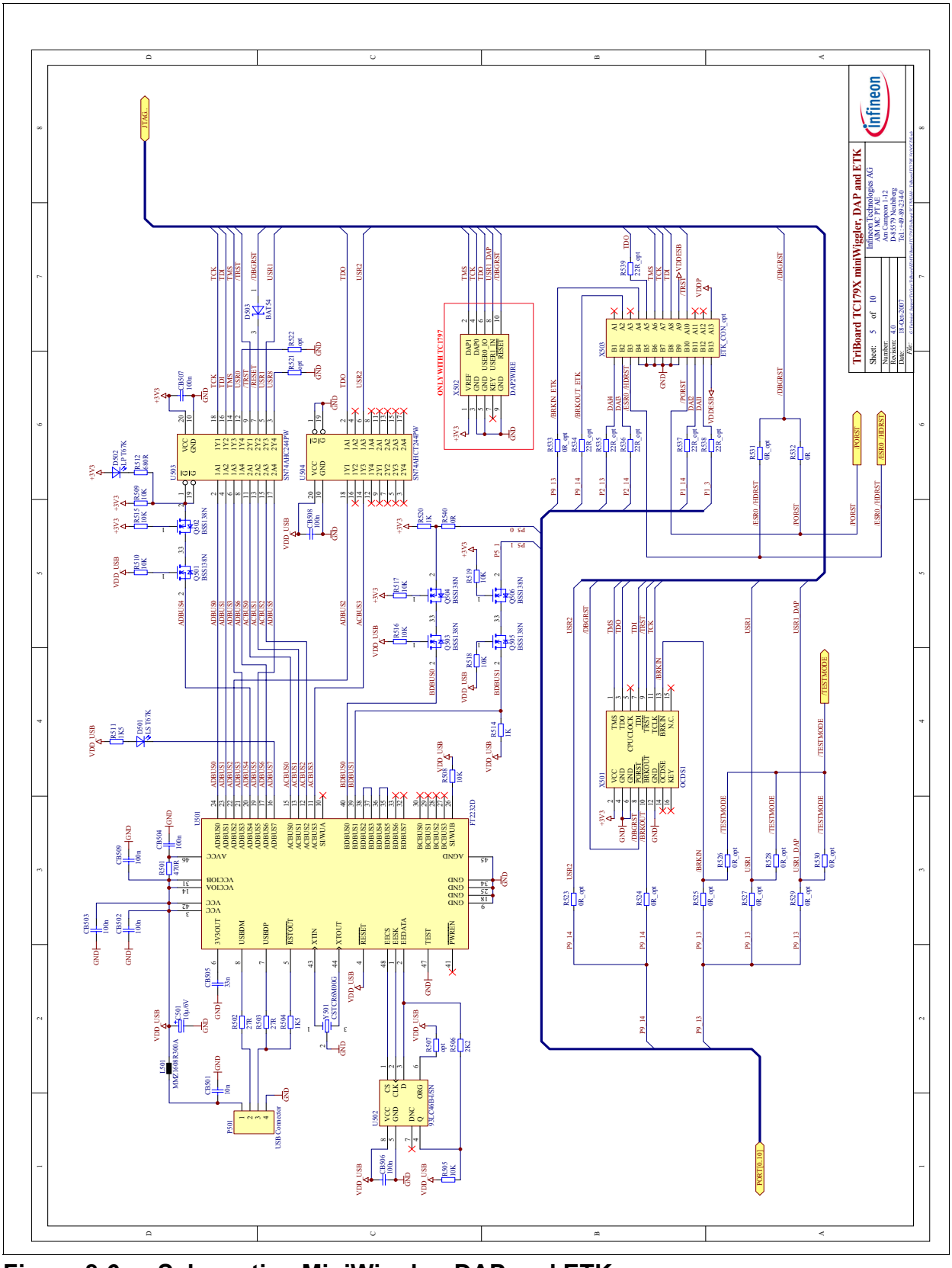


**Figure 8-6 Schematic - MiniWiggler, DAP and ETK**

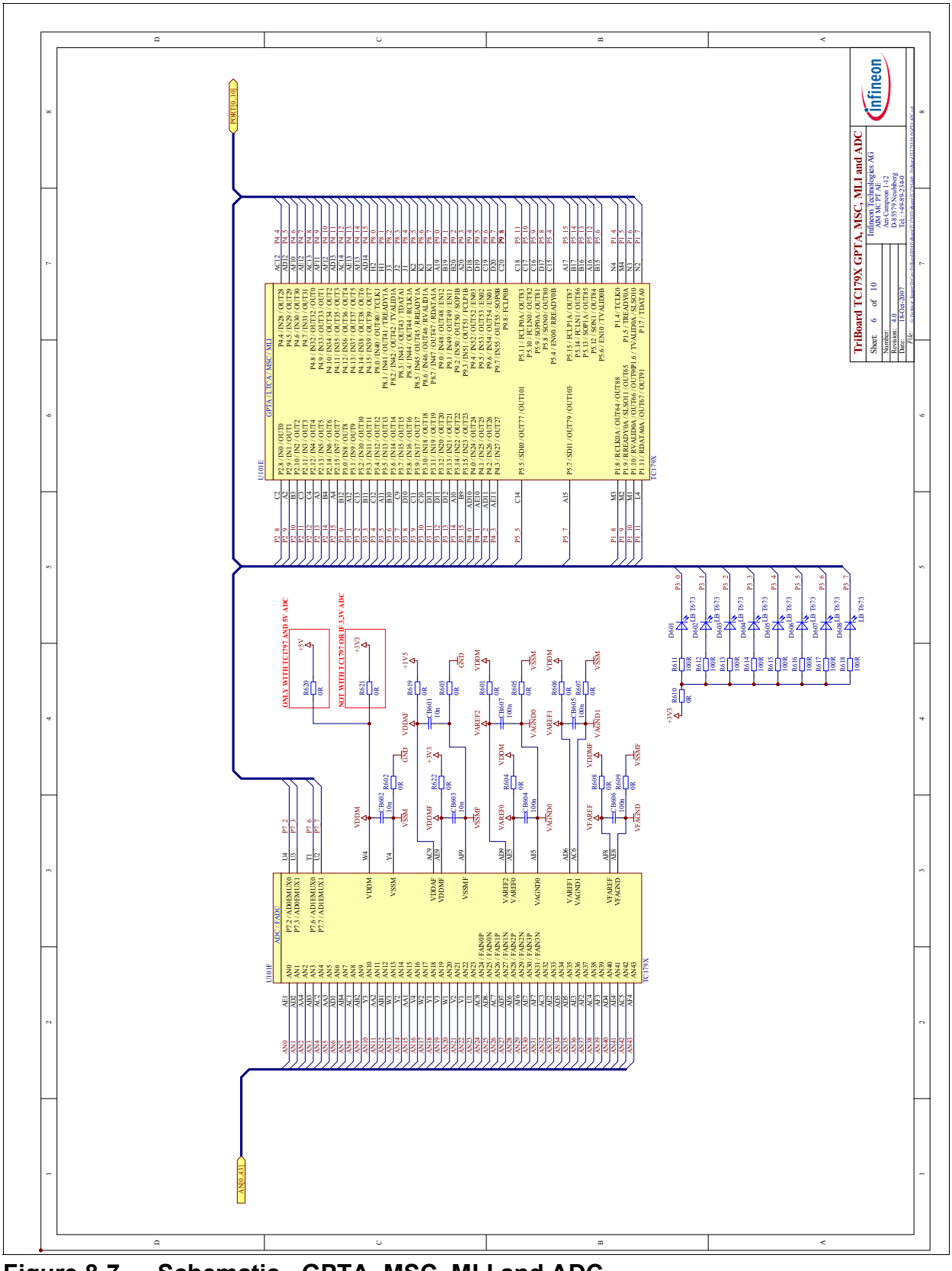


**Figure 8-7 Schematic - GPTA, MSC, MLI and ADC**

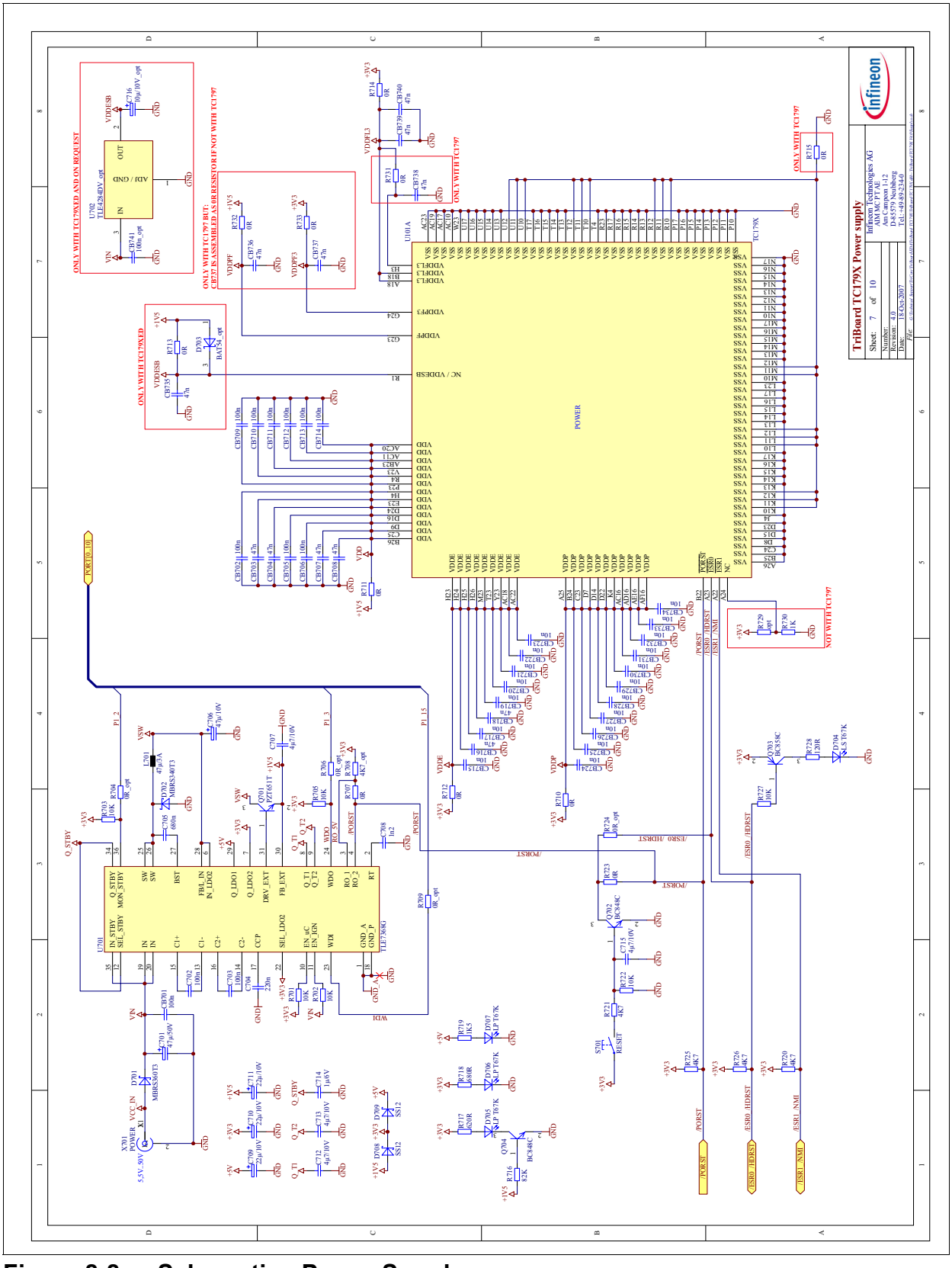


**Figure 8-8 Schematic - Power Supply**

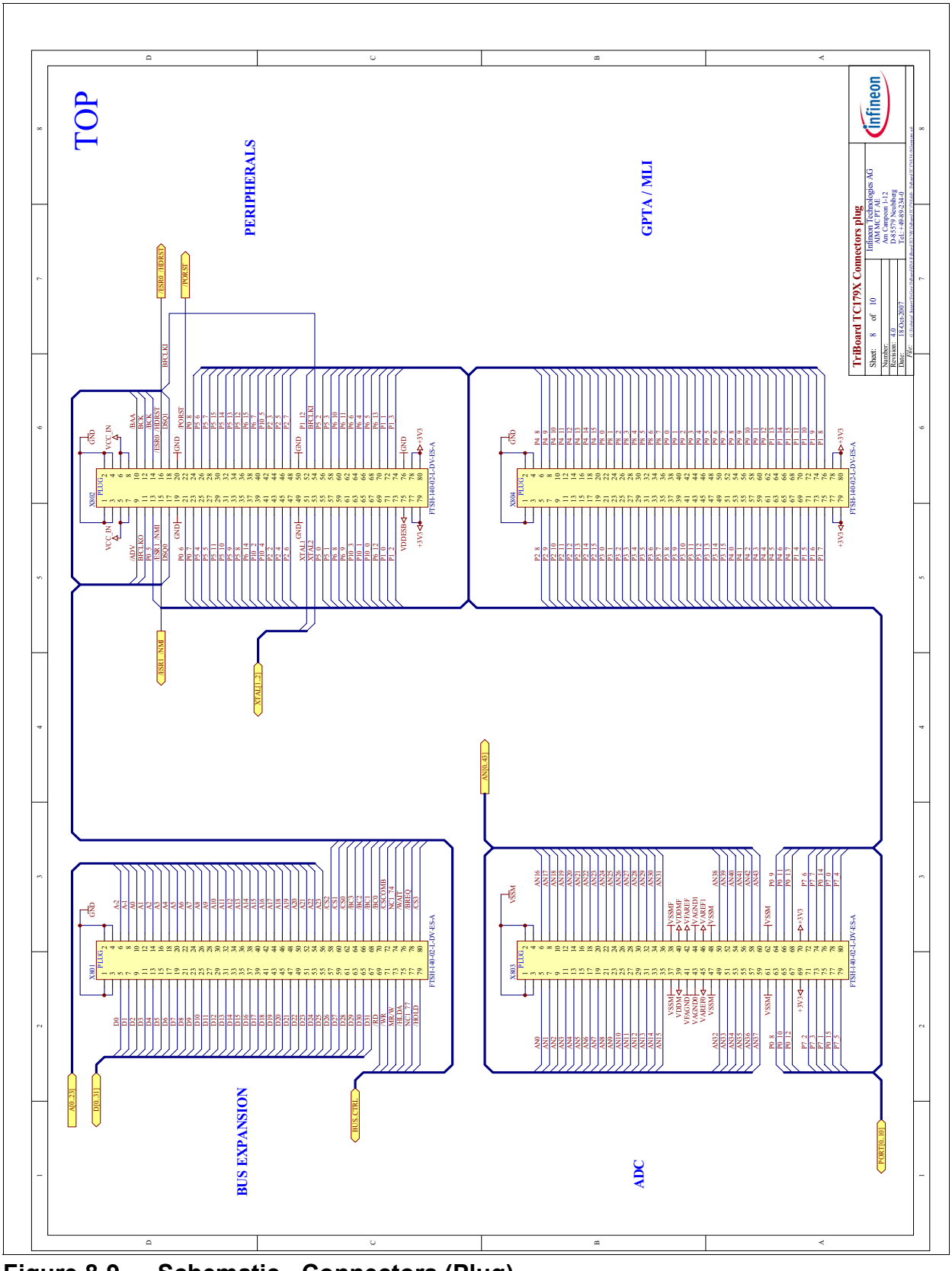


**Figure 8-9 Schematic - Connectors (Plug)**

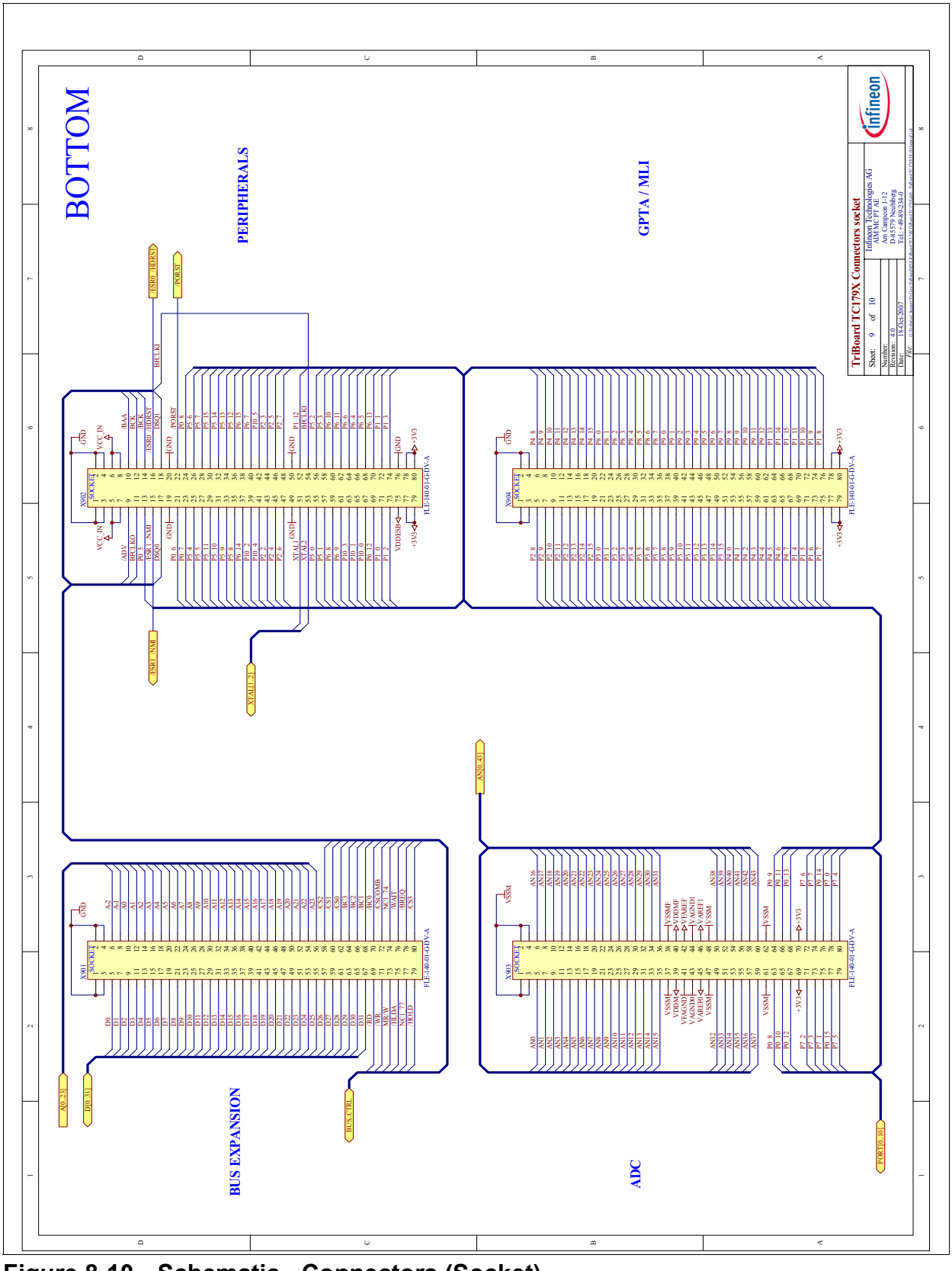


**Figure 8-10 Schematic - Connectors (Socket)**

## 8.2 Layout

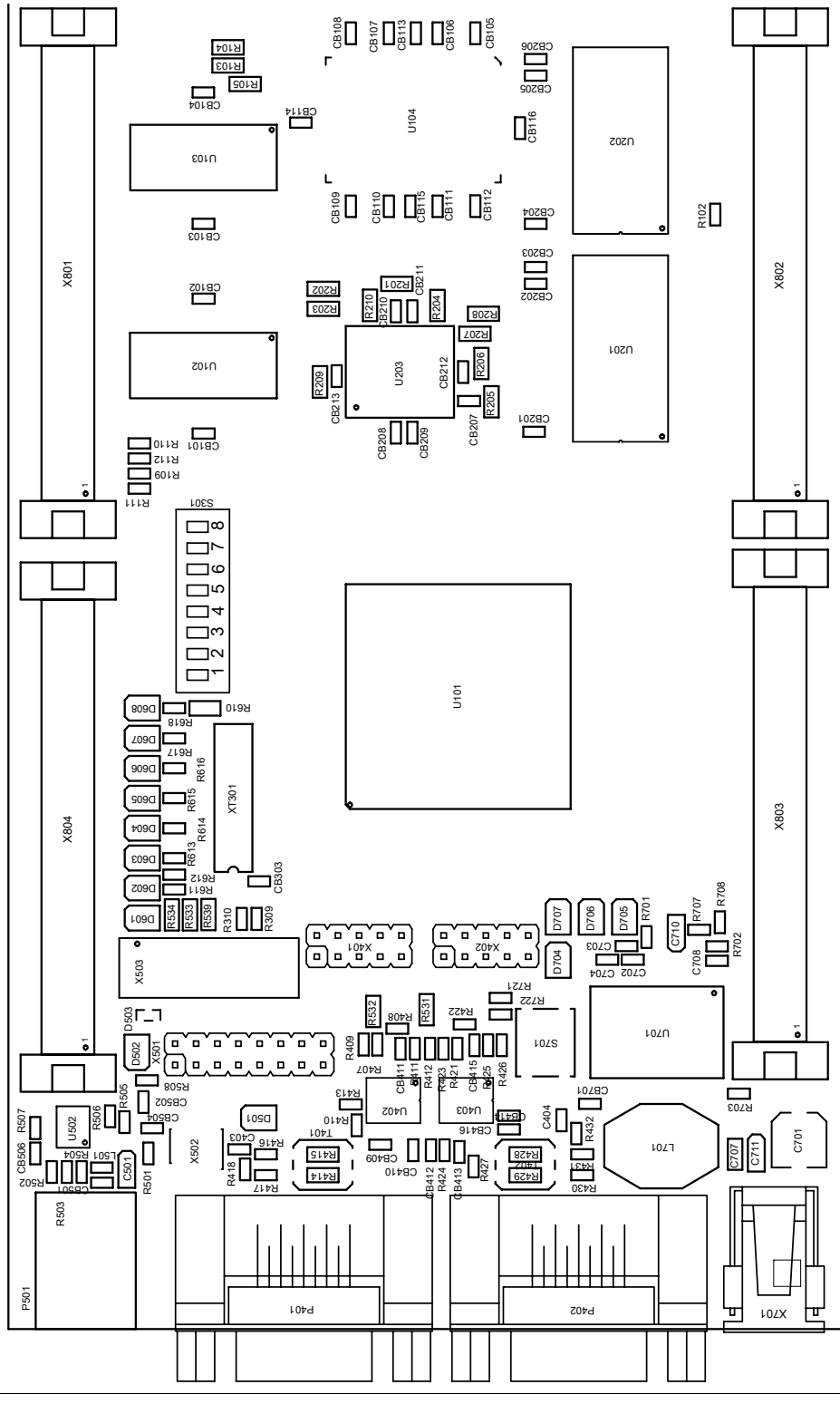


**Figure 8-11 Component Plot Top Layer**

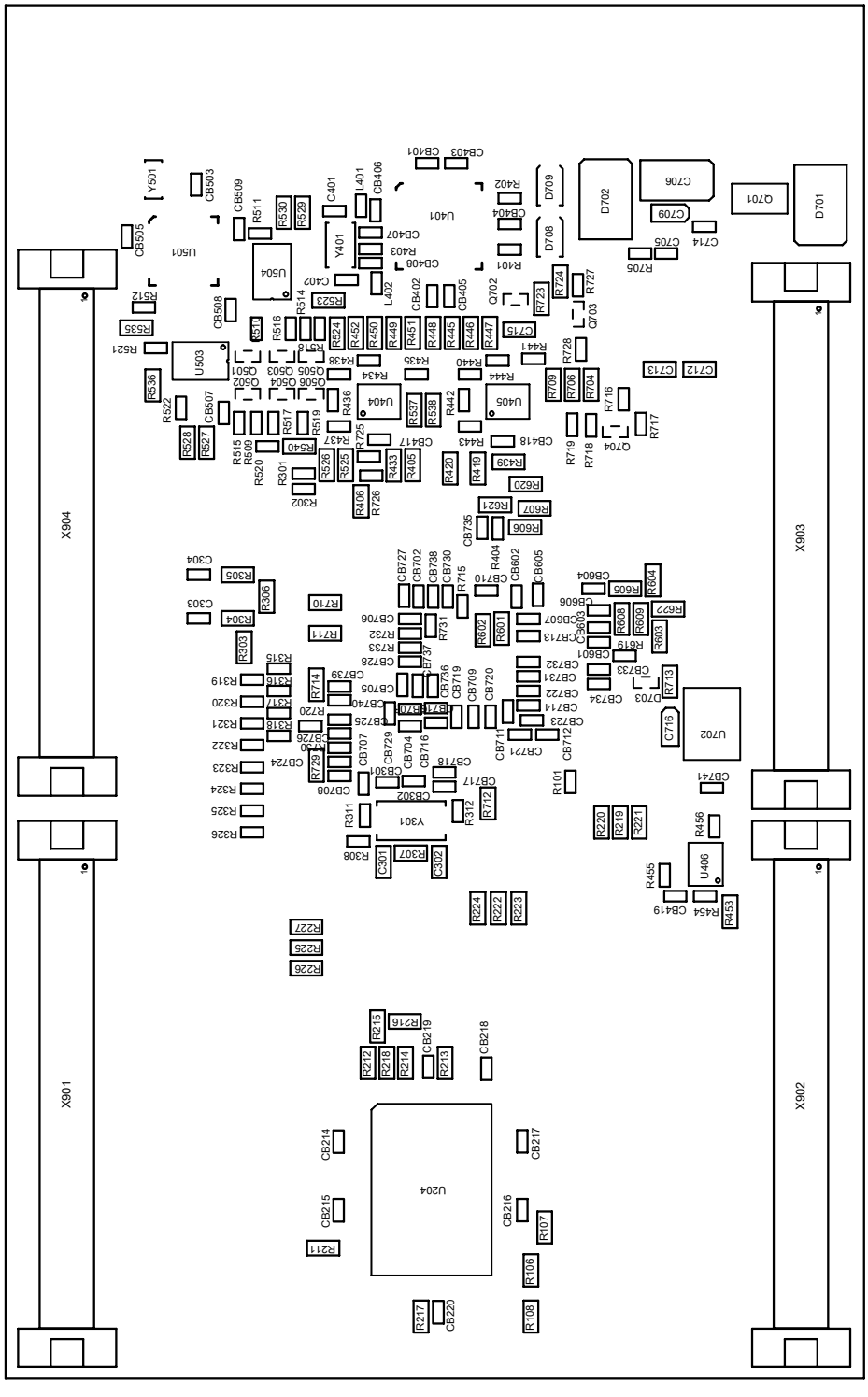


**Figure 8-12 Component Plot Bottom Layer**

## 8.3 Layout with Dimensioning

The following dimensions should be used for development of extension boards.

*Note: these are the pictures from the TriBoard TC10GP. Connectors X801...X804 are on the same place.*

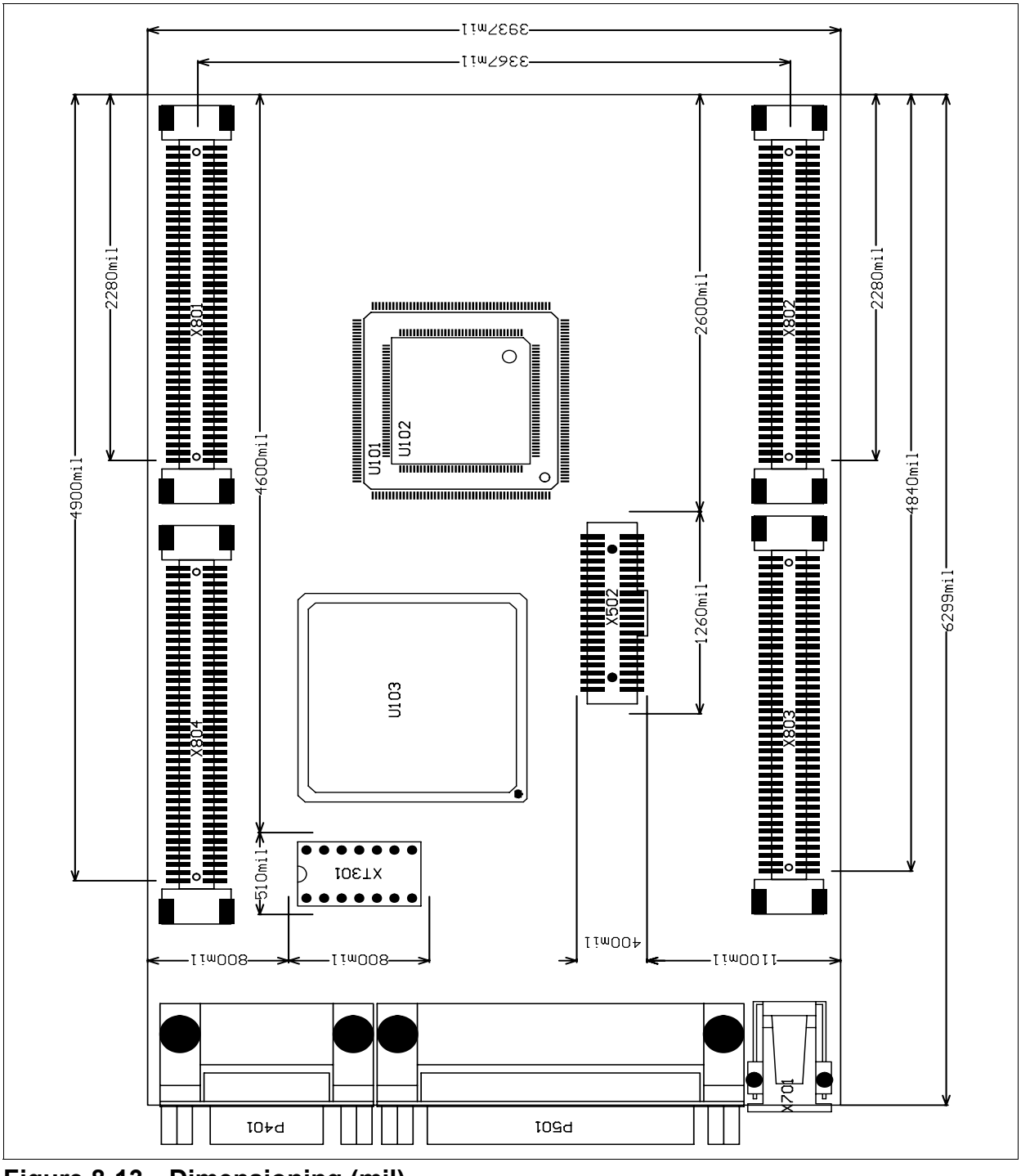


**Figure 8-13 Dimensioning (mil)**

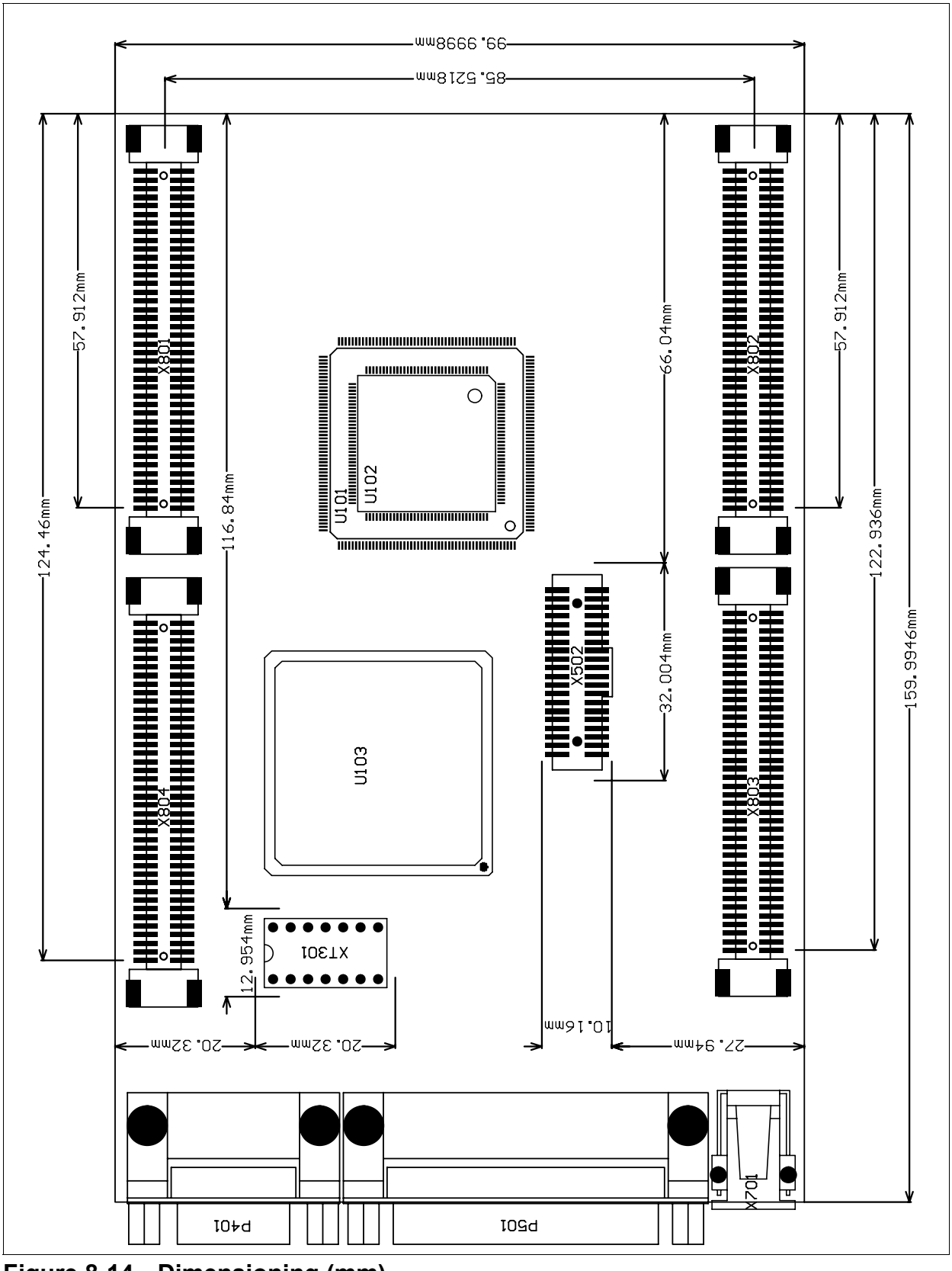


**Figure 8-14 Dimensioning (mm)**

# 9 Keyword Index

This section lists a number of keywords which refer to specific details of the TriBoard TC179X in terms of its architecture, its functional units or functions. This helps to quickly find the answer to specific questions about the TriBoard TC179X.

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