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TriBoard TC1130

Hardware Manual TC1130-300

32bit

Microcontrollers

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TriBoard TC1130 Hardware Manual TC1130-100

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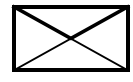

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1 Introduction

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 OCDS2). 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 setup of the TriBoard and the installation of the development software tool chain.

2 TriBoard Features

- CPU: - TC1130 (TriCore)
- MEMORY: - Burst FLASH up to 64 MBytes (default: 32 MBytes)
  - PC100 SDRAM 2 banks up to 64 MBytes per bank (default: 1 banks with 64 MBytes) or
  - Micron SyncFlash 2 banks with 16 MBytes per bank
- CLOCK: - Crystal 20MHz (default), Oscillator or External Clock
- INTERFACE: - DB9 for RS232-0
  - BERG10 for RS232-1
  - two BERG10 for CAN-0/1 with Transceiver
  - BERG16 for OCDS1
  - SAMTEC QSH-030-01-F-D-A for OCDS2
  - RJ45 Connector with LED's for Ethernet
  - USB connector (type B) for USB connections
  - DB25 On Board Wiggler for OCDS1
  - four 80-pin connectors (male) with all I/O signals
  - four 80-pin connectors (female) with all I/O signals
- POWER: - 5.5V to 60V
  - generated internally 5V for CAN, on board Wiggler
  - generated internally 3.3V
  - generated internally 1.5V
  - Power On Reset circuit used from power devices
- DIMENSION: - 100mm x 160mm (EURO-Board)

2.1 Block Diagram

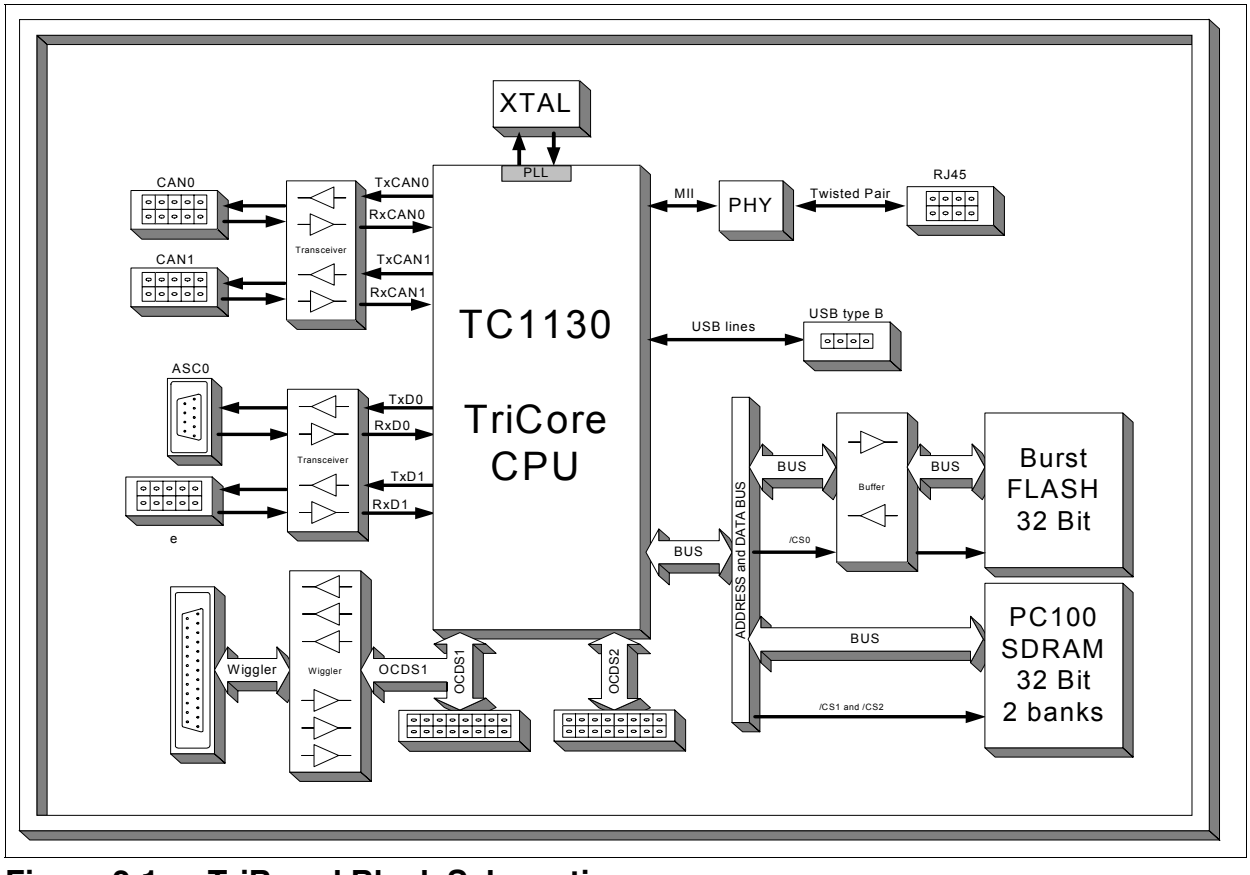

Figure 2-1 TriBoard Block Schematic

2.2 Placement

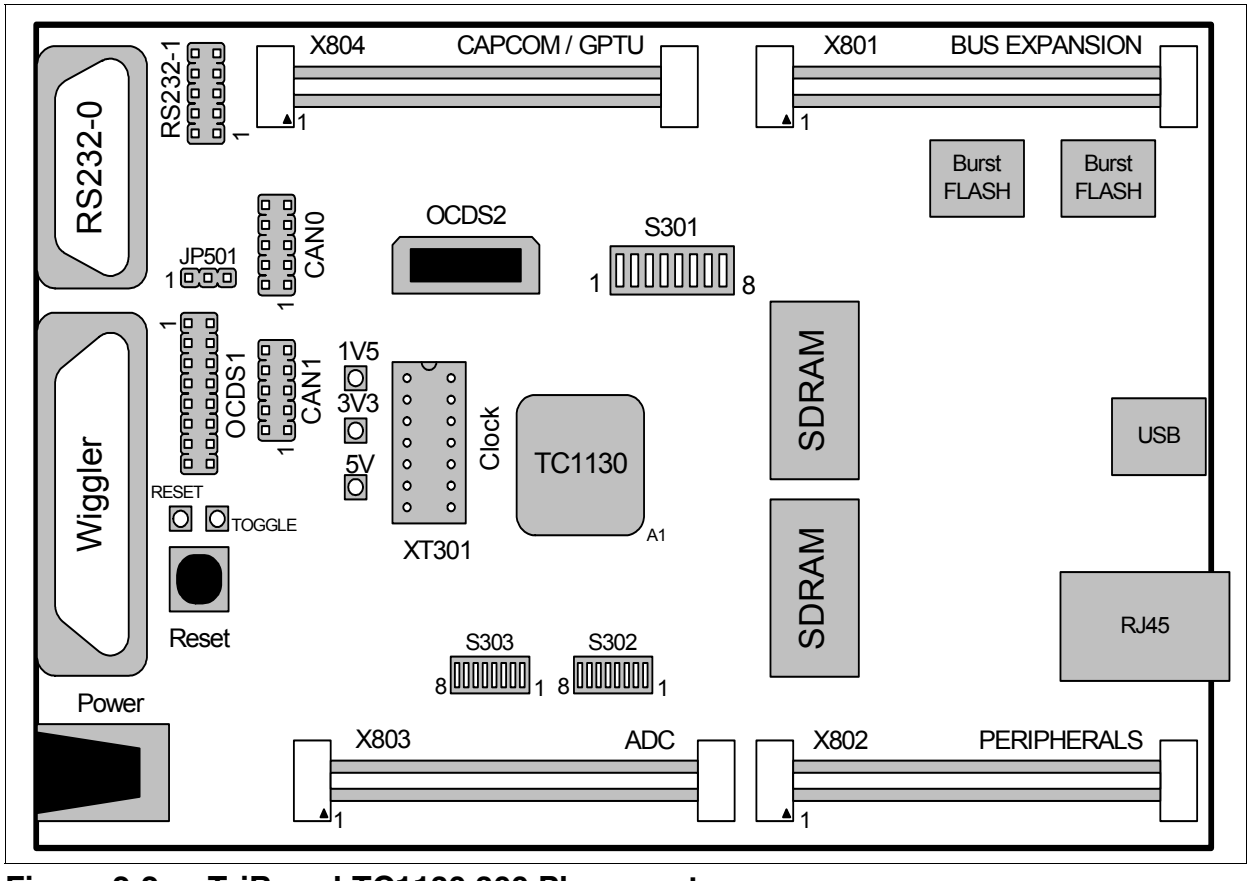

Figure 2-2 TriBoard-TC1130.300 Placement

3 TriBoard Information

3.1 Power Supply

The Board has to be connected to a single power supply with 5.5V to 60V DC. The TriBoard generates internally 3.3V and 1.5V. As a guide, a supply of 7V and 500mA is deemed sufficient for operation. 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. Three LED's indicate the status of the on board generated voltage.

A manual reset is executed by pressing the reset button.

3.2 Clock

There are three possibilities to apply the CPU clock.

- Large oscillator circuit (DIP14)
- Small oscillator circuit (DIP8)
- Crystal oscillator (default)
- 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.

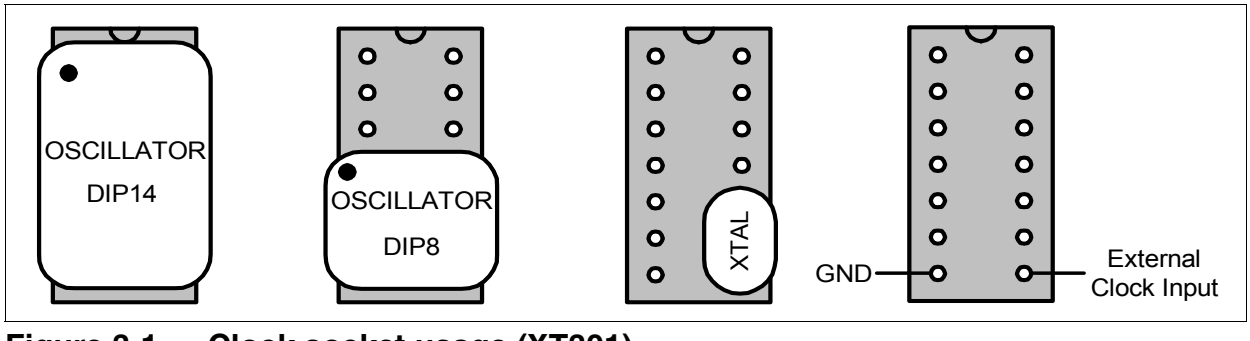

Figure 3-1 Clock socket usage (XT301)

3.3 Memory

The TriBoard supports the following memory configurations:

- 8 MBytes external ST Burst Flash
- 16 MBytes external ST Burst Flash
- 16 MBytes external Intel Burst Flash
- 32 MBytes external Intel Burst Flash (default)
- 64 MBytes external Intel Burst Flash

- 16 MBytes external SDRAM per bank or
- 32 MBytes external SDRAM per bank or
- 64 MBytes external SDRAM per bank (default, 1 bank) or
- 16 MBytes external Micron SyncFlash per bank

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

3.4 FLASH

The Flash uses 32 Data Bits (AD0...AD31) and 24 Address Bits (A0...A23). It's accessed via /CS0.

3.5 SDRAM

The SDRAM uses 32 Data Bits (AD0...AD31) and 18 Address Bits (A2...A16). Bank0 (U201 and U202) is connected to /CS1 and Bank1 (U203 and U204) to /CS2.

If Bank0 is equipped with 256MBit devices then remove R204 and R205 and assemble R201, R202 and R203.

If Bank1 is equipped with 256MBit devices then remove R209 and R210 and assemble R206, R207 and R208.

If Bank0 is equipped with Micron SyncFlash devices then assemble R211, R212 and R213.

If Bank1 is equipped with Micron SyncFlash devices then assemble R214, R215 and R216.

The board is always equipped with 256MBit devices on Bank0. Bank1 is not assembled.

Please refer to schematic **Figure 8-3** for more information.

3.6 Peripherals

The available peripherals on the TC1130 are

- System Timer
- General Purpose Timer Unit (GPTU)
- Asynchronous Serial Interface (ASC0, ASC1 and ASC2)
- Synchronous Serial Interface (SSC0 and SSC1)
- MultiCAN (CAN)
- I2C Module (I2C)
- Capture/Compare Unit 6 (CCU6)
- Micro Link Serial Bus Interface (MLI0 and MLI1)
- Ethernet (ETH)
- USB_11D (USB)

3.7 ASC

There are three ASC interfaces possible. ASC0 (via P2.1 and P2.0) is connected to the DB9 socket and ASC1(via P0.1 and P0.0) is connected to the BERG10 plug. ASC0 and ASC1 are driven via the RS232 Transceiver MAX3225. The DB9 socket can be connected to the serial port of a PC with a 1 to 1 RS232 cable.

To use the ASC interfaces via the plug X802 (without Transceiver) or connect another ASC to DB9 and BERG10 plug change the resistors R601, R602, R603, R605 and R614 up to R621. For more information look at the TC1130 User's Manual. for ports and the TriBoard schematics for the resistors (**Figure 8-7**).

3.8 SSC

On the TC1130 there are two synchronous serial interfaces available but there is no special plug on board. To connect peripherals to SSC's the connector X802 (Peripherals) can be used.

The SSC of the TC1130 is connected to a serial EEPROM with a size of 128K (16.384 x 8). As chip select for this EEPROM is used the I/O line P2.9. To disable the EEPROM remove resistor R604. Optional it is possible to have an AD converter connected to the SSC's. See **"ADC (optional)" on Page 3-4** for more information

3.9 MultiCAN

On the board are two CAN transceiver connected to the MultiCAN on TC1130. The transceivers are connected to two BERG10 plug. For the pinout of BERG10 plug see Figure 7-8 on page 8.

To use the interfaces via the plug X802 (without Transceiver) or connect another CAN-node to the transceiver . Change the resistors R406 up to R413 and R454 up to R457. For more information look at the TC1130 User's Manual. for ports and the TriBoard schematics for the resistors (**Figure 8-5**).

3.10 USB

The TriBoard provide an USB type B connector (X602). Optional, this USB connector can be used with an on board transceiver (see **Figure 8-7**).

3.11 Ethernet

The TriBoard provide a RJ45 connector (X401) for twisted pair ethernet connections. The TriBoard use a Intel LXT941A as physical interface device. For more information about the ethernet modul see TC1130 User's Manual, about the PHY see the LXT941A datasheet.

3.12 ADC (optional)

The TriBoard is prepared for a 10 channel AD converter with 16-Bit resolution. To use this AD converter you must assemble the following devices:

- AD7708BR (U603)
- Crystal 32,786kHz size TQEC45
- 2 SMD capacitor 18pF size 0603 (C605, C606)
- HF-coil 10µH (L601)
- SMD Tantal capacitor 10µF/10V size A (C607)
- 3 SMD capacitor 100nF size 0603 (CB603, CB604, CB605)
- 3 SMD resistor 0R size 0603 (R606, R607, R612)

To connect the device to port 2 (SSC0) you need:

- 4 SMD resistor 0R size 0603 (R608, R609, R610, R611)

To connect the device to port 3 (SSC1) you need:

- 4 SMD resistor 0R size 0603 (R622, R623, R624, R630)

It is possible to connect the RDY pin of AD converter to P0.14. To do this you need:

- 1 SMD resistor 0R size 0603 (R613)

For more information about the AD converter, programming and access please see the datasheet of AD7708 and the user's manual of TC1130. For the needed devices please see **Figure 8-7** and their locations see **Figure 8-12** and **Figure 8-13**.

3.13 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:

- I/O P2.9 is used as chip select for the serial eeprom on board.

3.14 Toggle LED

P0.7 is connected to a single LED (D401) and can be controlled by Software. This status LED is low active.

3.15 Debug System

3.15.1 OCDS

The OCDS1 signals are connected to the BERG16 plug (X501). They work with the port supply of 3.3V.

The OCDS2 signals are connected to the SAMTEC HighSpeed plug (X502). They also work with the port supply of 3.3V.

The clock signal for OCDS1 and OCDS2 is always TRCLK.

3.15.2 On Board Wiggler

The On Board Wiggler is used to connect a PC to the TriBoard OCDS1 via the 5V parallel port.

The Wiggler can be enabled or disabled by setting the jumper JP501 (see **Table 4-2** and **Figure 8-12**).

4 TriBoard Configuration

4.1 Boot Configuration

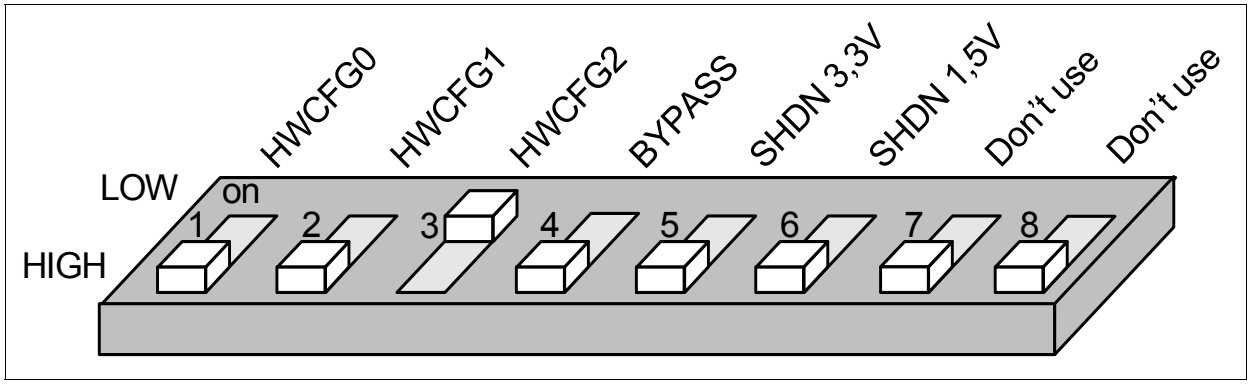

Figure 4-1 Configuration DIP-Switch

The picture above shows the definition of the boot 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.

4.1.1 TC1130 Boot Configuration

Table 4-1 Boot Configuration for TC1130

Note: The shadowed line indicates the default setting.

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

Note: The two signals /OCDS_E and /BRK_IN will be set by the Debugger via OCDS-Interface.

/BRK_IN	CFG[2...0]	Type of Boot	PC Start value
1	000	Serial boot from ASC to PMI scratchpad, run loaded program	0xD4000000
1	001	Serial boot from CAN to PMI scratchpad, run loaded program	0xDFFFFFFC
1	010	Serial boot from SSC to PMI scratchpad, run loaded program	0xDFFFFFFC
1	011	External memory, EBU as master	0xA0000000
1	100	External memory, EBU as slave	0xA0000000
1	101	External memory, EBU as master	0xA0000000
1	110	PMI scratchpad	0xD4000000
1	111	reserved; don't use this combination	-
0	01x 1xx	reserved; don't use this combination	-
0	001	go to external emulator space	0xDE000000
0	000	put chip in tristate (deep sleep)	-

4.2 SW Boot Configuration

The TC1130 has 16 inputs (Port 1) which are latched with the /HDRST signal. This latched value can be used as SW configuration. On the Topside (see **Figure 8-12**) from the TriBoard exist two Dipswitches which can be used for SW configuration. The Dipswitches are connected to a driver which drive the signals from the Dipswitches during /HDRST is activ. If the Dipswitch is closed the the corresponding bit is low otherwise high.

Refer to Users Manual TC1130 for more information.

All pins can be used by your own software.

4.3 Clock Selection

The resulting CPU clock is:

- $f_{CPUCLK} = \frac{N}{PK} \cdot f_{OSC}$ without Bypass (switch is ON)
- $f_{CPUCLK} = f_{OSC}$ with Bypass (switch is OFF)

Note: The factors K, P and N are controlled via bitfields in register PLL_CLC located in the SCU.

The resulting system clock is:

- $f_{SYSTEMCLK} = \frac{f_{CPUCLK}}{2}$ if SYSFS cleared (default after reset)
- $f_{SYSTEMCLK} = f_{CPUCLK}$ if SYSFS is set

Note: The bit SYSFS is controlled via bit 2 in register PLL_CLC located in the SCU.

4.4 Jumper Settings.

Table 4-2 Jumper for On Board Wiggler

Note: The shadowed line indicates the default setting

Setting	On Board Wiggler
1 - 2	Enable On Board Wiggler
2 - 3	Disable On Board Wiggler

4.5 Optional Resistors

Table 4-3 Resistors for XTAL1 Operation

R315	use XT301 (default: short)
R317	Rserial (default: short)
R316	Rparallel (default: open)

5 TriBoard Software

5.1 Requirements

To install the software from your TriBoard or Starterkit CD you need a PC with Windows95/98/ME, WindowsNT4.0 or Windows 2000.

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. Ashling, GreenHills, HighTec, Hitex, Lauterbach, Tasking, PLS...). To install tools for compiling and debugging use seperat CD's from Toolvendors. There are also some application notes and software examples. The directory "Schematics" contains libraries and some examples of extension boards in the Protel file format. The data sheets of all used parts can be found in the "TriBoard_Components" directory. The manuals for the microcontrollers and the TriBoard are located in the "Manual" folder.

The current Errata Sheet can be found in the directory "Erata 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

Table 6-1 Power Signals

Short Name	Description
VCC_IN	Supply Input (5,5V...60V)
GND	Ground
VDDL	Core Logic Supply Voltage (1.5V)
VDDM	Core Memory Supply Voltage (1.5V)
VDDP	Port Supply Voltage (3.3V)
VDDOSC3	Main Oscillator Power Supply Voltage (3.3V)
VDDOSC	Main Oscillator Power Supply Voltage (1.5V)

Table 6-2 Reset Signals

Short Name	Description
/PORST	External Power On Reset
/HDRST	Hardware Reset
HWCFG0	Hardware Configuration Input 0
HWCFG1	Hardware Configuration Input 1
HWCFG2	Hardware Configuration Input 2

Table 6-3 Interrupt Signals

Short Name	Description
/NMI	Non Maskable Interrupt

Table 6-4 Clock Signals

Short Name	Description
XTAL1	Crystal Oscillator Input
XTAL2	Crystal Oscillator Output
SDCLKO	SDRAM Clock Output
SDCLKI	SDRAM Clock Input
BFCLKO	Burst Mode Flash Clock Output
BFCLKI	Burst Mode Flash Clock Input
TRCLK	Trace Clock Output

Table 6-5 BUS Signals

Short Name	Description
AD[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
/BAA	Burst address advance output
/ADV	Address Valid
/BREQ	Bus Request Output
/HOLD	Hold Request Input
/HLDA	Hold Acknowledge
/WAIT	Wait Input
ALE	Address Latch Enable
/RAS	Row Address Strobe
/CAS	Column Address Strobe
CKE	Clock Enable Output
/BREQ	Bus Request Output
/HOLD	Hold Request Input
/HLDA	Hold Acknowledge
/WAIT	Wait

Table 6-7 Debug Signals

Short Name	Description
/TRST	Test Reset
TCLK	Test Clock
TMS	Test Mode Select

Table 6-7 Debug Signals (cont'd)

TDI	Test Data Input
TDO	Test Data Output
TESTMODE	Test Mode Select Input
/BRK_IN	TriCore Breakpoint Input
/BRK_OUT	TriCore Breakpoint Output
BRKPT[0...2]	TriCore Breakpoint
STATUS[0...4]	TriCore Status
IND_PC[0...7]	TriCore Indirect Program Counter

Table 6-8 Peripheral Signals

Short Name	Description
RXD0	Receive Data ASC0
RXD0	Receive Data ASC0
TXD1	Transmit Data ASC1
RXD1	Receive Data ASC1
P0 [0...15]	General Purpose I/O Port 0.0 ... 0.15
P1 [0...15]	General Purpose I/O Port 1.0 ... 1.15
P2 [0...15]	General Purpose I/O Port 2.0 ... 2.15
P3 [0...15]	General Purpose I/O Port 3.0 ... 3.15
P4 [0...7]	General Purpose I/O Port 4.0 ... 4.7
MII_TXCLK	MII Transmit Clock
MII_RXCLK	MII Receive Clock
MII_MDIO	MII Data Input / Output
D+	USB Dataline +
D-	USB Dataline -

Table 6-9 Analog Signals (optional)

Short Name	Description
AN [0...9]	Analog Input 0 ... 9
ANCOM	Optional Reference Voltage Input
VAREF	Analog Reference Voltage Supply
VAGND	Analog Reference Voltage Supply Ground

Table 6-9 Analog Signals (optional)

VADC	Power Supply ADC Converter
VSSA	Power Supply Ground ADC Converter

7 Connector Pin Assignment

The TriBoard is 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

7.1 TC1130 Connector

BUS EXPANSION (X801,X901)				PERIPHERALS (X802,X902)			
GND	1	2	GND	GND	1	2	GND
GND	3	4	GND	GND	3	4	GND
D0	5	6	A0	VCC_IN	5	6	VCC_IN
D1	7	8	A1	VCC_IN	7	8	VCC_IN
D2	9	10	A2	/ADV	9	10	/BAA
D3	11	12	A3	BFCLKO	11	12	RMW
D4	13	14	A4	/CSEMU	13	14	
D5	15	16	A5	/NMI	15	16	/HDRST
D6	17	18	A6		17	18	
D7	19	20	A7	GND	19	20	GND
D8	21	22	A8	P1.10	21	22	/PORST
D9	23	24	A9	P1.11	23	24	P1.0
D10	25	26	A10	P1.12	25	26	P1.1
D11	27	28	A11	P1.13	27	28	P1.2
D12	29	30	A12	MII_TXCLK	29	30	P1.3
D13	31	32	A13	MII_RXCLK	31	32	MII_MDIO
D14	33	34	A14	P1.7	33	34	P1.5
D15	35	36	A15	P1.8	35	36	P1.6
D16	37	38	A16	P1.9	37	38	P1.4
D17	39	40	A17	GND	39	40	P1.14
D18	41	42	A18	P0.6	41	42	GND
D19	43	44	A19	P2.10	43	44	P2.11
D20	45	46	A20	P2.14	45	46	P2.15
D21	47	48	A21	P2.12	47	48	P2.13
D22	49	50	A22	GND	49	50	GND
D23	51	52	A23	XTAL1	51	52	
D24	53	54		XTAL2	53	54	BFCLKI
D25	55	56		P2.0	55	56	P2.8
D26	57	58	/CS2	P2.1	57	58	P2.9
D27	59	60		P0.8	59	60	P0.10
D28	61	62	/CS0	P0.9	61	62	P0.11
D29	63	64	/BC3	P2.4	63	64	P2.7
D30	65	66	/BC2	P2.3	65	66	P2.6
D31	67	68	/BC1	P2.2	67	68	P2.5
/RD	69	70	/BC0	P0.12	69	70	P0.13
/WR	71	72	ALE	P0.8	71	72	P0.9
MRW	73	74		P0.10	73	74	P0.11
P0.6	75	76	/WAIT		75	76	GND
	77	78	P0.4	3V3	77	78	3V3
P0.5	79	80	/CS3	3V3	79	80	3V3

Figure 7-1 Connector for TC1130 - Pinout (Part I)

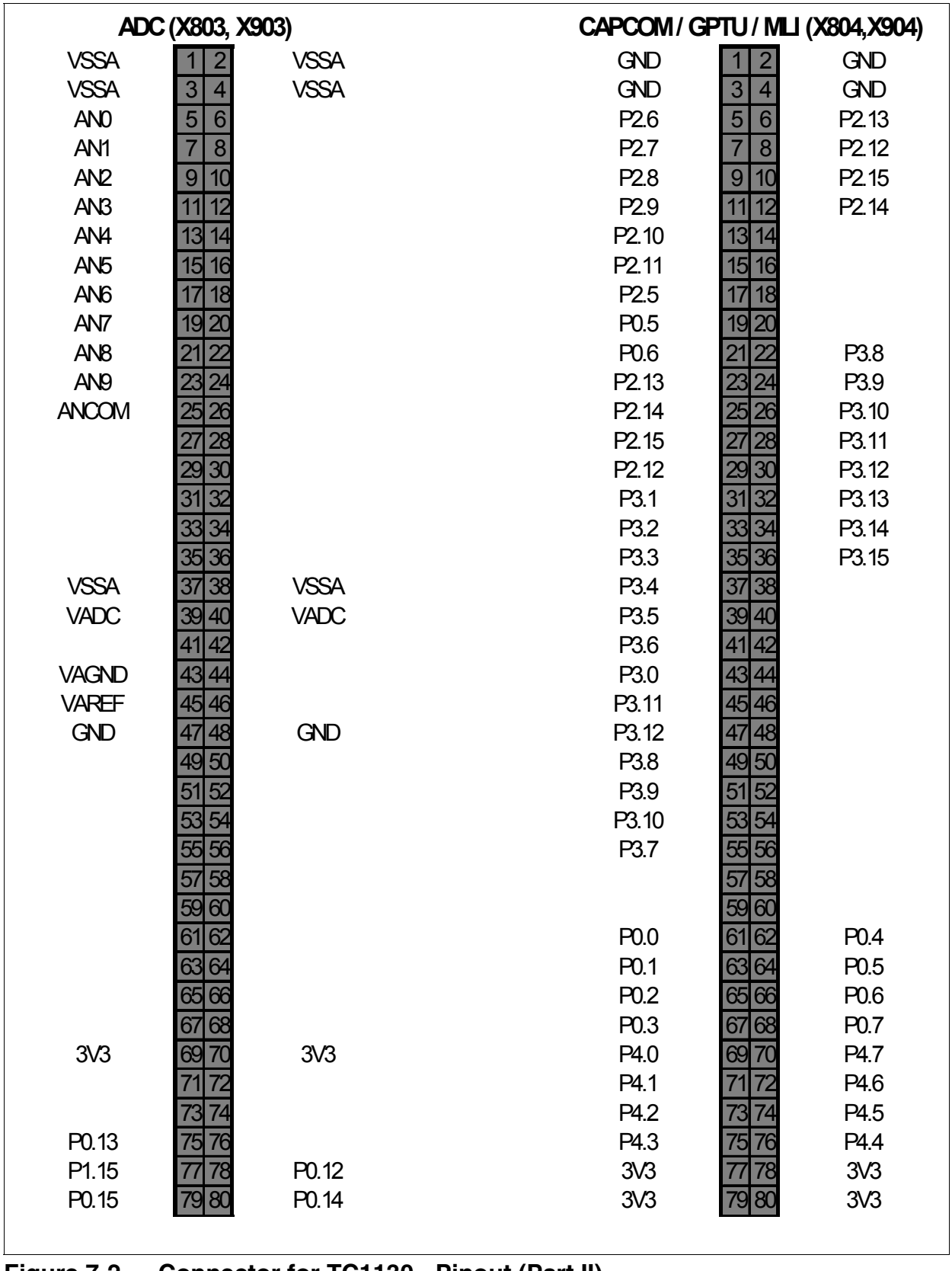

Figure 7-2 Connector for TC1130 - Pinout (Part II)

7.2 General Connector

The general connector is defined as an standard for future releases of boards like the TriBoard. There have been borne in mind yet another TriCore based CPUs.

BUS EXPANSION (X801,X901)				PERIPHERALS / OCDS (X802,X902)			
GND	1	2	GND	GND	1	2	GND
GND	3	4	GND	GND	3	4	GND
AD0	5	6	A0	VCC_IN	5	6	VCC_IN
AD1	7	8	A1	VCC_IN	7	8	VCC_IN
AD2	9	10	A2	/ADV	9	10	/BAA
AD3	11	12	A3	EBUCLK_OUT	11	12	/CODE
AD4	13	14	A4	/CSEMU	13	14	/CSOVL
AD5	15	16	A5	/NMI	15	16	/HRST
AD6	17	18	A6	SVM	17	18	VDDFLT
AD7	19	20	A7	GND	19	20	GND
AD8	21	22	A8	/TRST	21	22	/PORST
AD9	23	24	A9	TCLK	23	24	STATUS0
AD10	25	26	A10	TMS	25	26	STATUS1
AD11	27	28	A11	TDI	27	28	STATUS2
AD12	29	30	A12	TDO	29	30	STATUS3
AD13	31	32	A13	/OCDS_E	31	32	STATUS4
AD14	33	34	A14	/BRK_IN	33	34	/TESTMODE
AD15	35	36	A15	/BRK_OUT	35	36	SCAN_E
AD16	37	38	A16	FT-ANALOG	37	38	BRKPT0
AD17	39	40	A17	BRKPT1	39	40	BRKPT2
AD18	41	42	A18	IND_PC0	41	42	IND_PC1
AD19	43	44	A19	IND_PC2	43	44	IND_PC3
AD20	45	46	A20	IND_PC4	45	46	IND_PC5
AD21	47	48	A21	IND_PC6	47	48	IND_PC7
AD22	49	50	A22	GND	49	50	GND
AD23	51	52	A23	XTAL1	51	52	XTAL3
AD24	53	54	A24	XTAL2	53	54	EBUCLK_IN
AD25	55	56	A25	RXD0_EXT	55	56	RXD1_EXT
AD26	57	58	/CS2	TXD0	57	58	TXD1
AD27	59	60	/CS1	RXCAN0	59	60	RXCAN1
AD28	61	62	/CS0	TXCAN0	61	62	TXCAN1
AD29	63	64	/BC3	SCLK0	63	64	SCLK1
AD30	65	66	/BC2	MTSR0	65	66	MTSR1
AD31	67	68	/BC1	MRST0	67	68	MRST1
/RD	69	70	/BC0	RXJ1850	69	70	TXRJ1850
/WR	71	72	ALE	P13.12	71	72	P13.13
/RAS	73	74	/CAS	P13.14	73	74	P13.15
/HLDA	75	76	/WAIT	VDDSTBY	75	76	GND
/CSFPI	77	78	/BREQ	VDDPERI	77	78	VDDBUS
/HOLD	79	80	/CS3	VDDPERI	79	80	VDDBUS

Figure 7-3 General Connector - Pinout (Part I)

ADC / GPIO (X803, X903)

VSSA	1	2	VSSA		
VSSA	3	4	VSSA		
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		
VSSA	37	38	VSSA		
VDDA2	39	40	VDDA2		
VDDA2	41	42	VDDA2		
VSSAREF0	43	44	VSSAREF1		
VDDAREF0	45	46	VDDAREF1		
GND	47	48	GND		
GPTU1.0	49	50	GPTU1.1		
GPTU1.2	51	52	GPTU1.3		
GPTU1.4	53	54	GPTU1.5		
GPTU1.6	55	56	GPTU1.7		
PCP_PC0	57	58	PCP_PC1		
PCP_PC2	59	60	PCP_PC3		
PCP_PC4	61	62	PCP_PC5		
PCP_PC6	63	64	PCP_PC7		
PCP_PC8	65	66	P2.0		
/PCP_BRK_O	67	68	PCP_PC_OR		
VDDPERI	69	70	VDDBUS		
AD0EMUX0	71	72	AD1EMUX0		
AD0EMUX1	73	74	AD1EMUX1		
AD0EMUX2	75	76	AD1EMUX2		
AD0EXTIN0	77	78	AD0EXTIN1		
AD1EXTIN0	79	80	AD1EXTIN1		

GPTU / GPTA (X804,X904)

GND	1	2	GND		
GND	3	4	GND		
GPTA0	5	6	GPTA32		
GPTA1	7	8	GPTA33		
GPTA2	9	10	GPTA34		
GPTA3	11	12	GPTA35		
GPTA4	13	14	GPTA36		
GPTA5	15	16	GPTA37		
GPTA6	17	18	GPTA38		
GPTA7	19	20	GPTA39		
GPTA8	21	22	GPTA40		
GPTA9	23	24	GPTA41		
GPTA10	25	26	GPTA42		
GPTA11	27	28	GPTA43		
GPTA12	29	30	GPTA44		
GPTA13	31	32	GPTA45		
GPTA14	33	34	GPTA46		
GPTA15	35	36	GPTA47		
GPTA16	37	38	GPTA48		
GPTA17	39	40	GPTA49		
GPTA18	41	42	GPTA50		
GPTA19	43	44	GPTA51		
GPTA20	45	46	GPTA52		
GPTA21	47	48	GPTA53		
GPTA22	49	50	GPTA54		
GPTA23	51	52	GPTA55		
GPTA24	53	54	GPTA56		
GPTA25	55	56	GPTA57		
GPTA26	57	58	GPTA58		
GPTA27	59	60	GPTA59		
GPTA28	61	62	GPTA60		
GPTA29	63	64	GPTA61		
GPTA30	65	66	GPTA62		
GPTA31	67	68	GPTA63		
GPTU0.0	69	70	GPTU0.4		
GPTU0.1	71	72	GPTU0.5		
GPTU0.2	73	74	GPTU0.6		
GPTU0.3	75	76	GPTU0.7		
VDDPERI	77	78	VDDBUS		
VDDPERI	79	80	VDDBUS		

Figure 7-4 General Connector - Pinout (Part II)

7.3 Power Connector Pinout

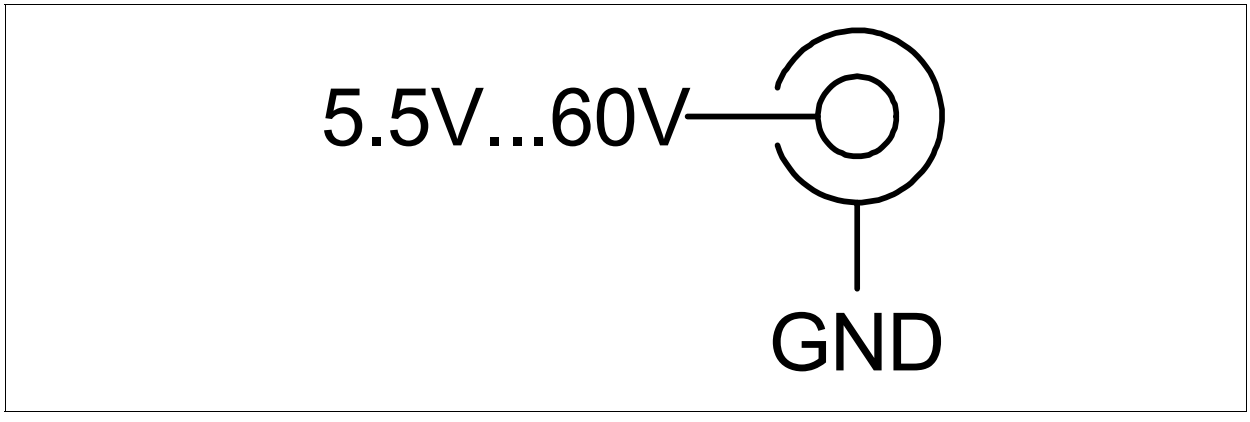

Figure 7-5 Power Connector Pinout

7.4 RS232 Pinout

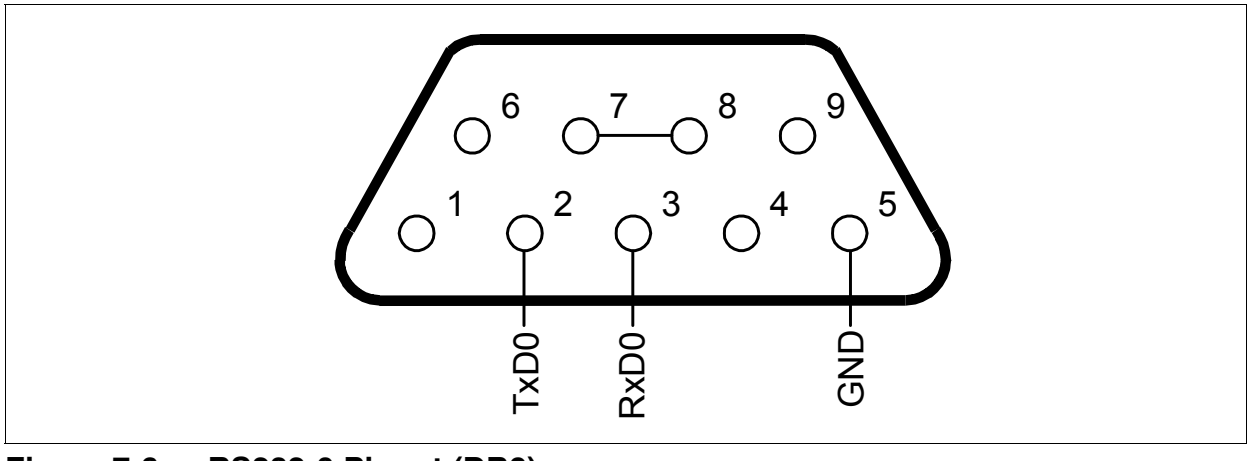

Figure 7-6 RS232-0 Pinout (DB9)

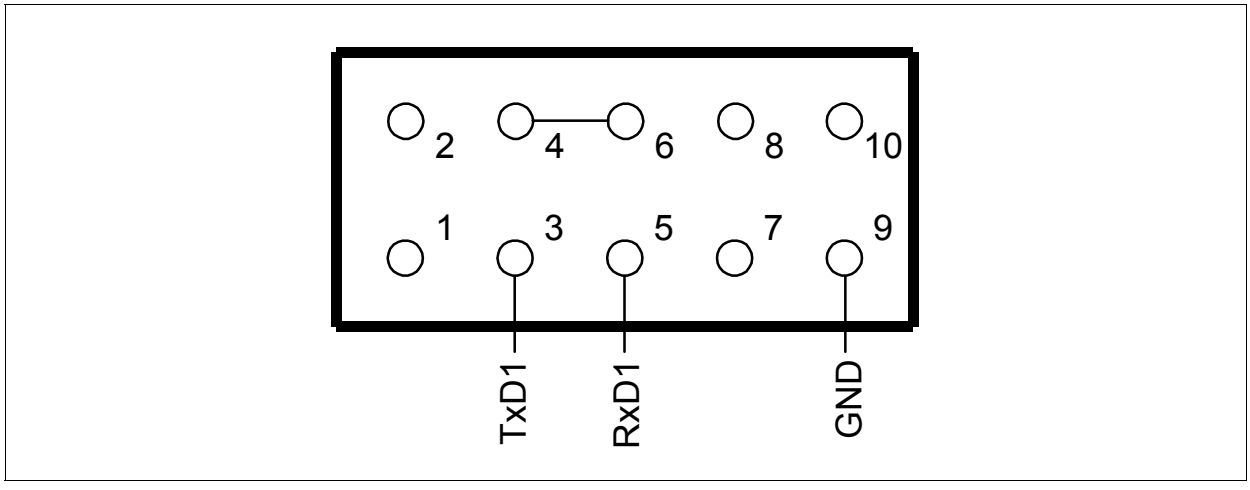

Figure 7-7 ASC1 Pinout (BERG10)

7.5 CAN Pinou

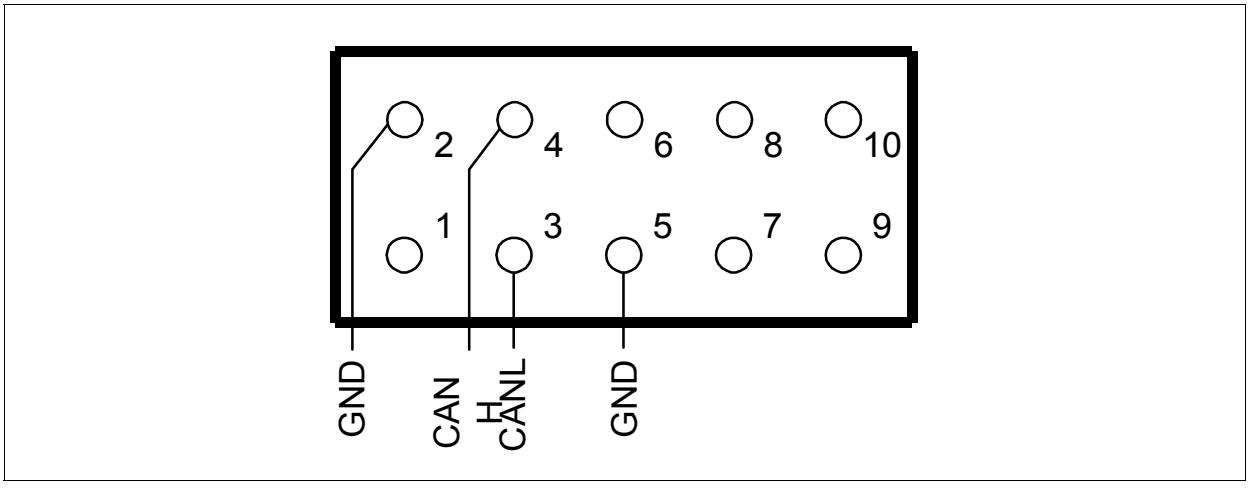

Figure 7-8 CAN Pinout (BERG10)

7.6 OCDS Pinout

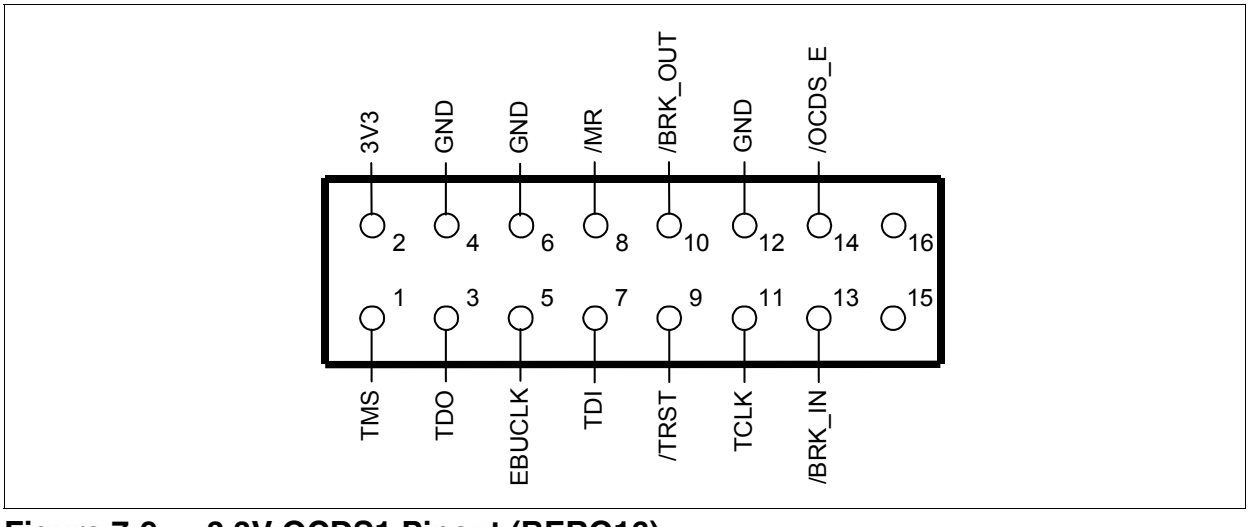

Figure 7-9 3.3V OCDS1 Pinout (BERG16)

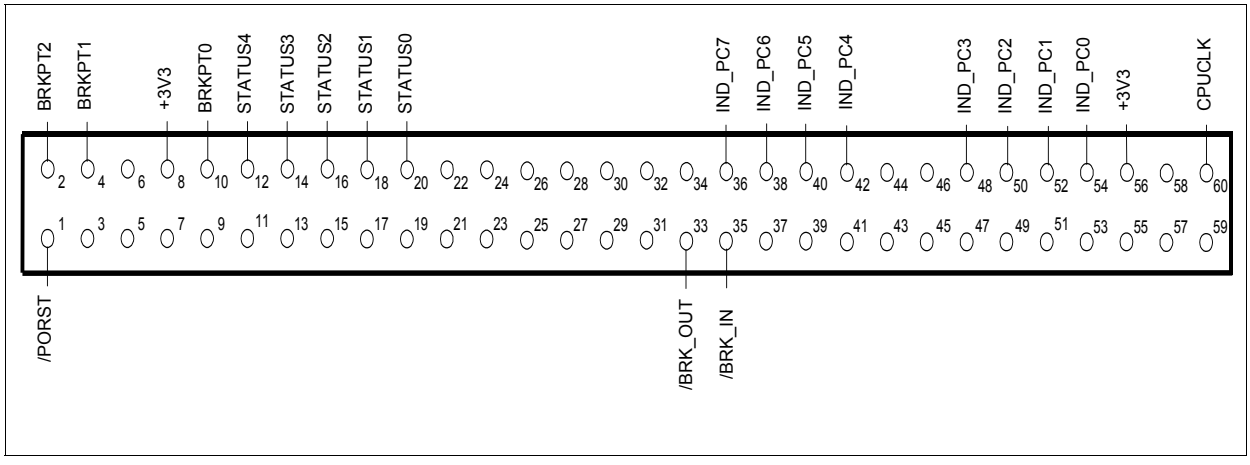

Figure 7-10 3.3V OCDS2 Pinout (SAMTEC QSH)

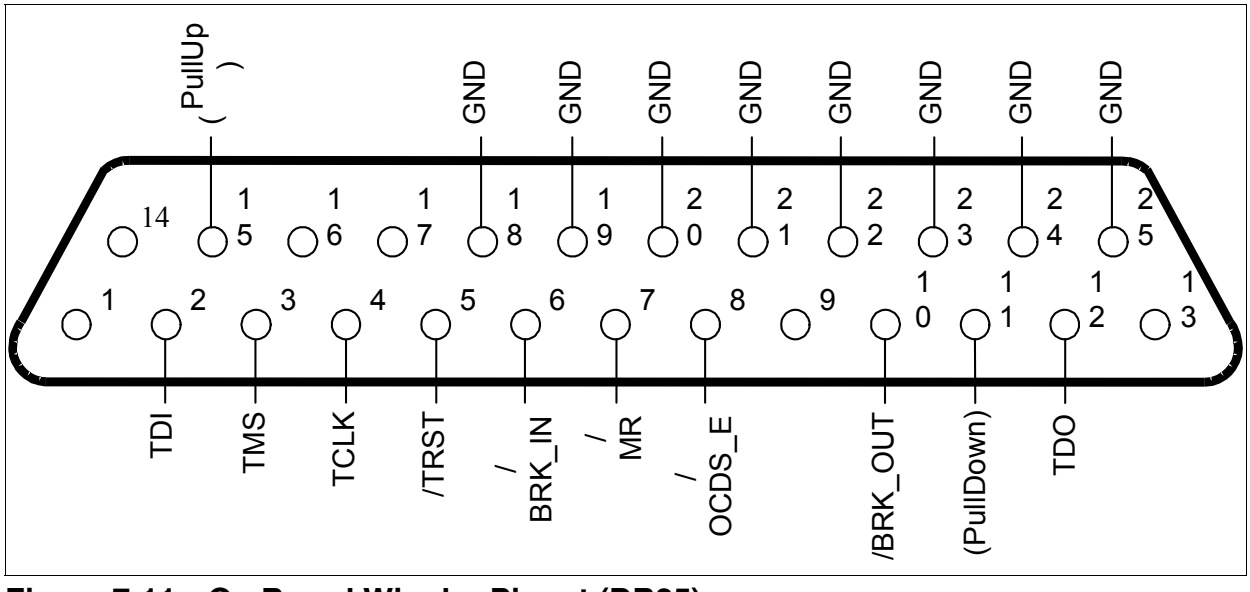

Figure 7-11 On Board Wiggler Pinout (DB25)

8 Schematic and Layout

8.1 Schematic

8.1.1 Changes to the Schematic

1. No changes to Schematic.

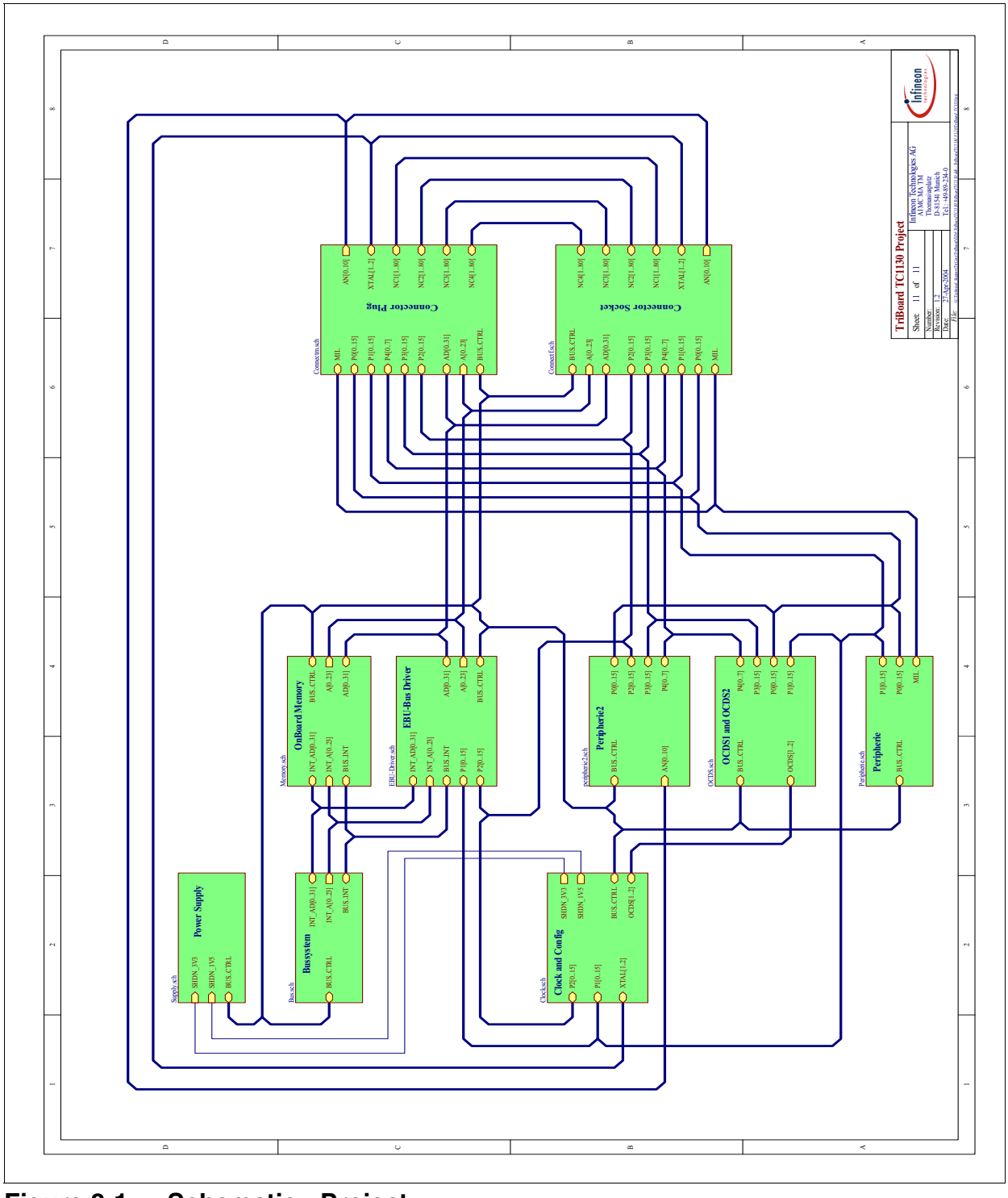

Figure 8-1 Schematic - Project

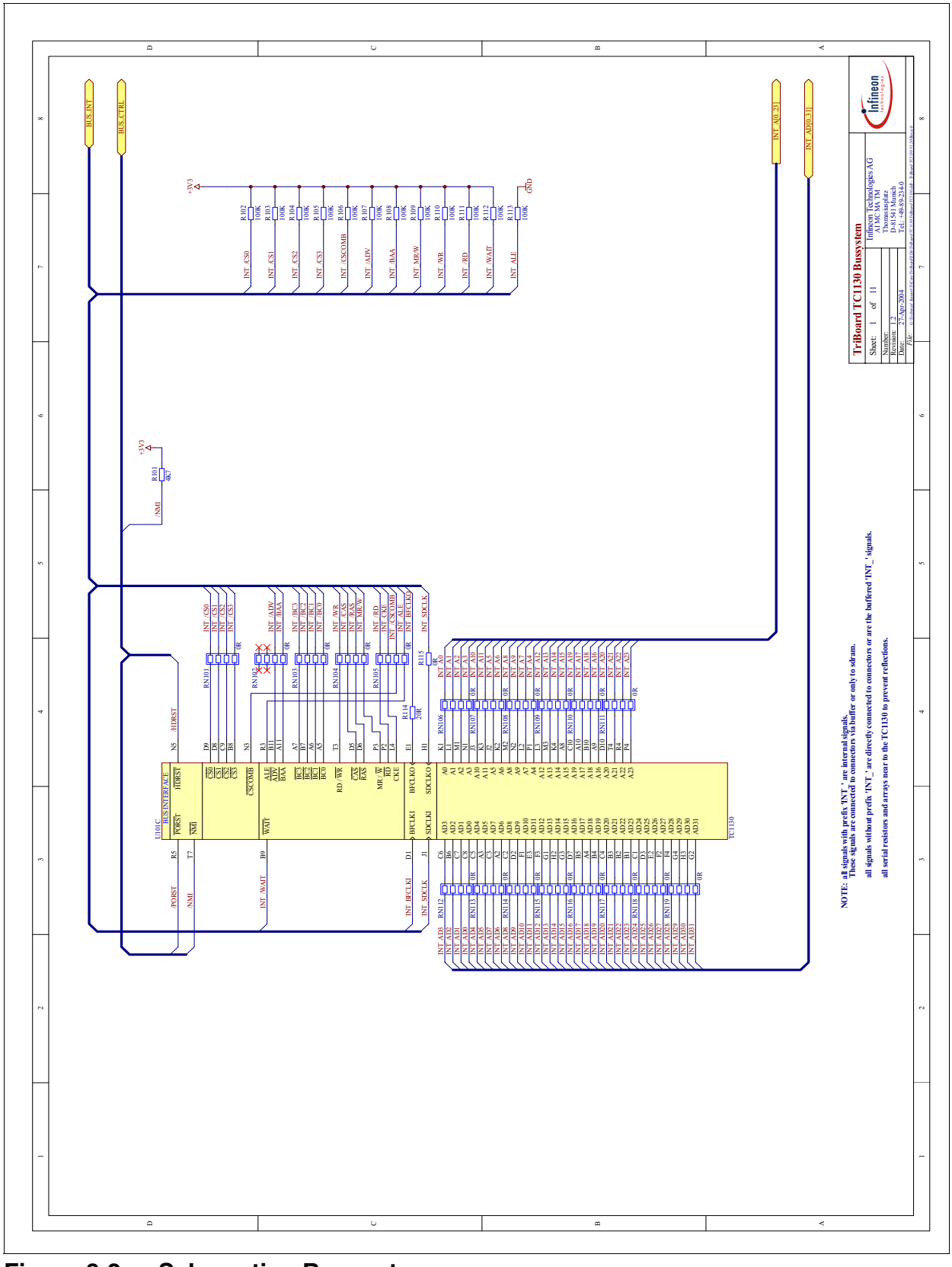

Figure 8-2 Schematic - Bussystem

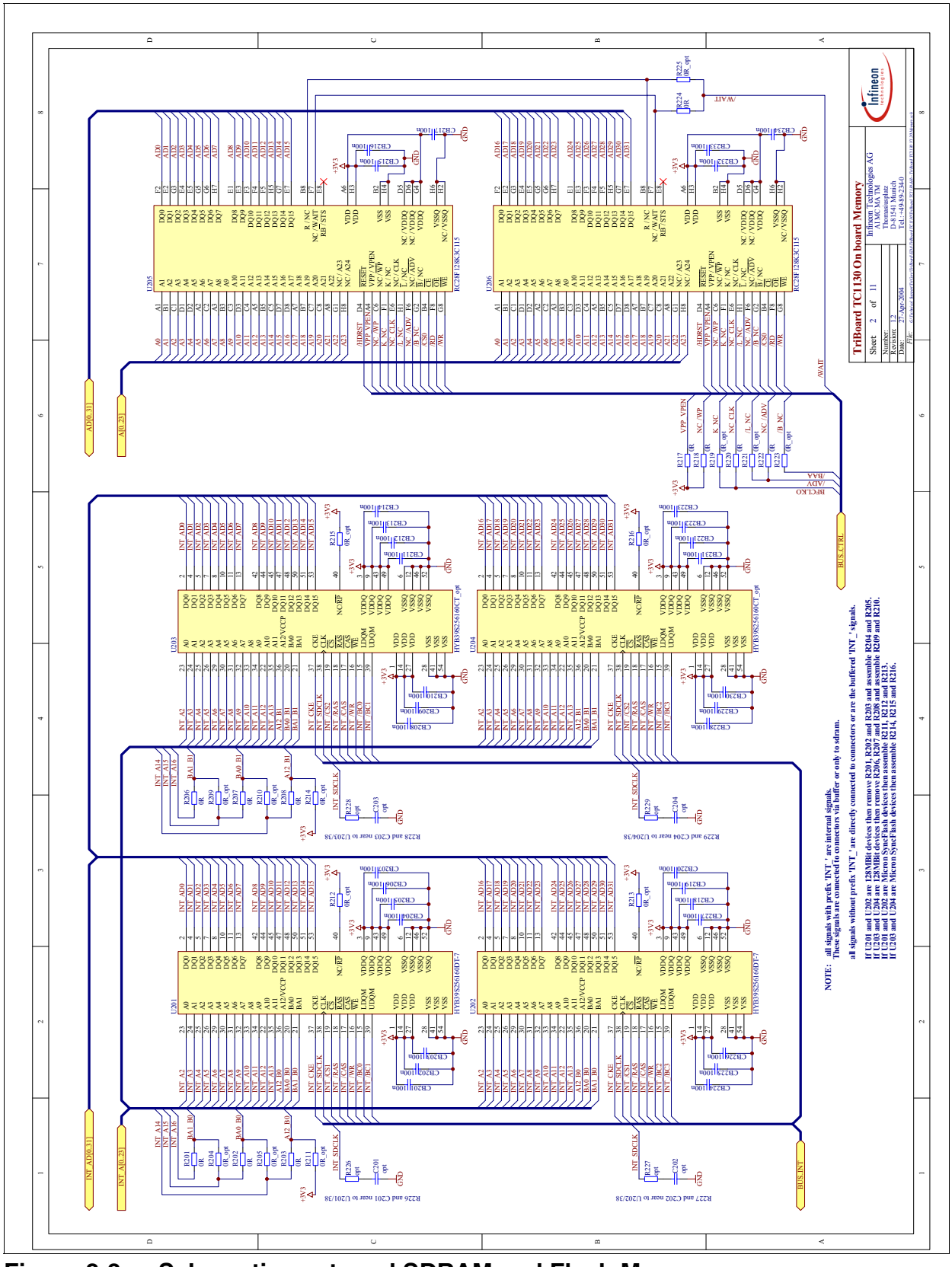

Figure 8-3 Schematic - external SDRAM and Flash Memory

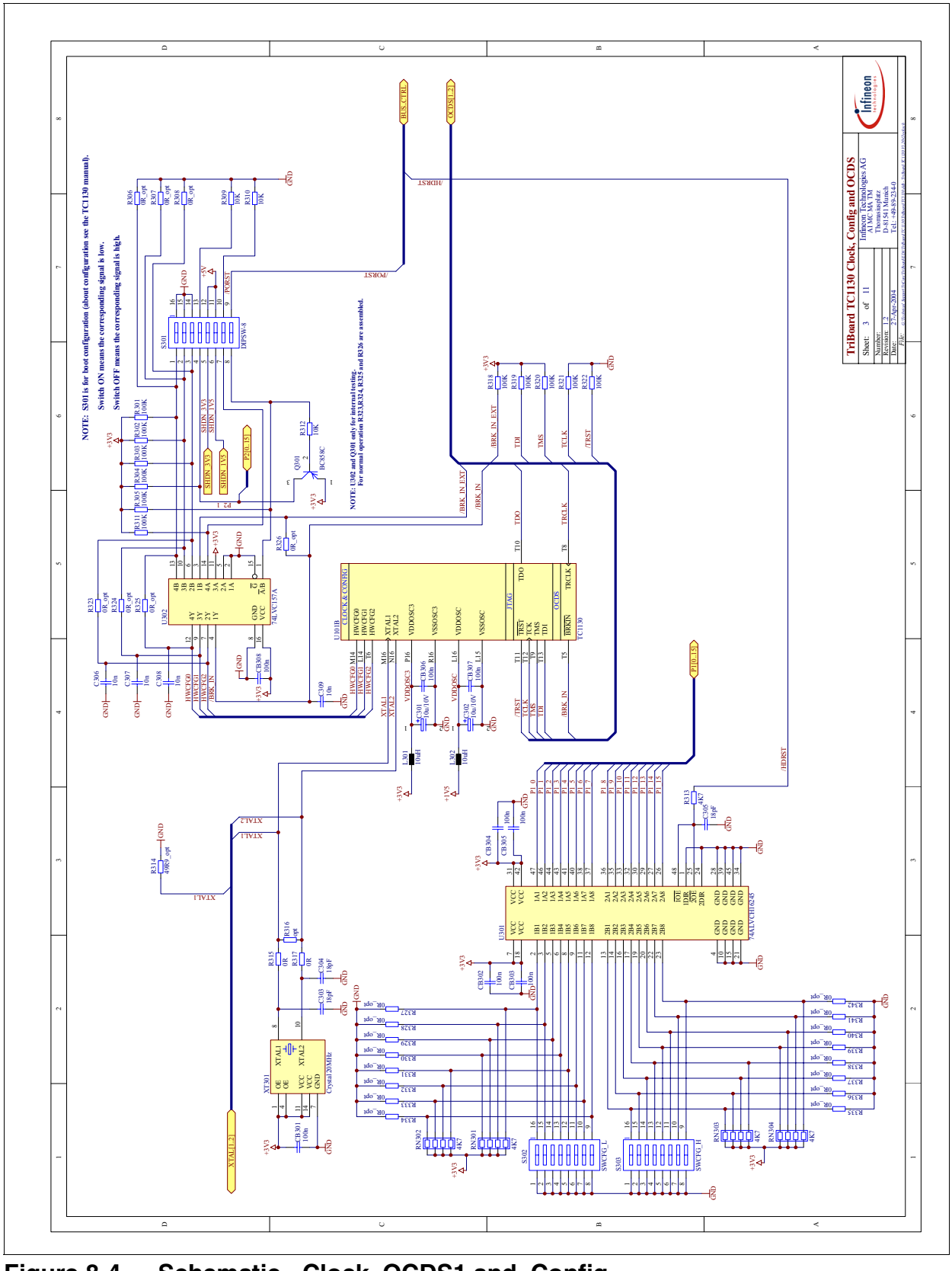

Figure 8-4 Schematic - Clock, OCDS1 and Config

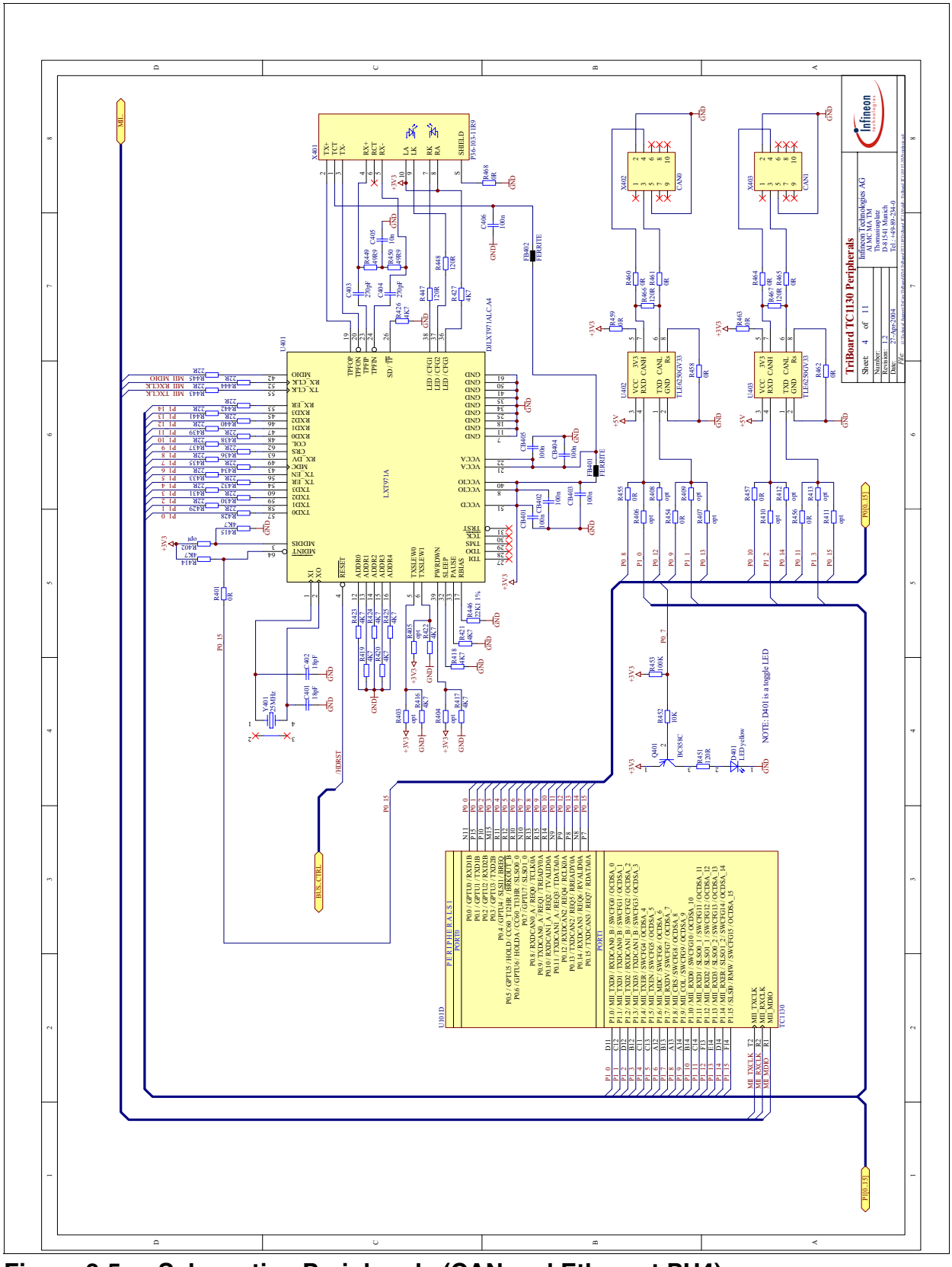

Figure 8-5 Schematic - Peripherals (CAN and Ethernet PH4)

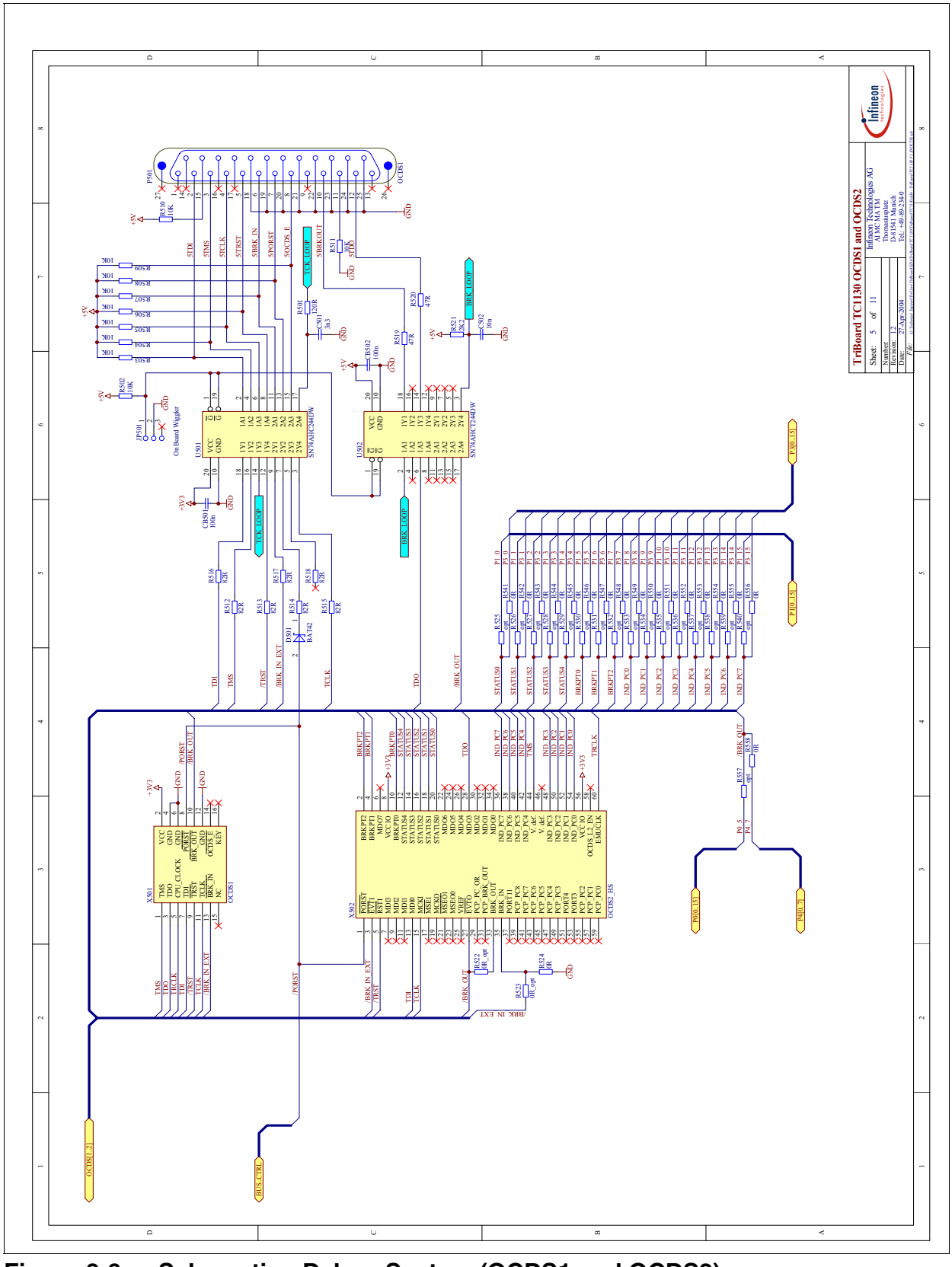

Figure 8-6 Schematic - Debug System (OCDS1 and OCDS2)

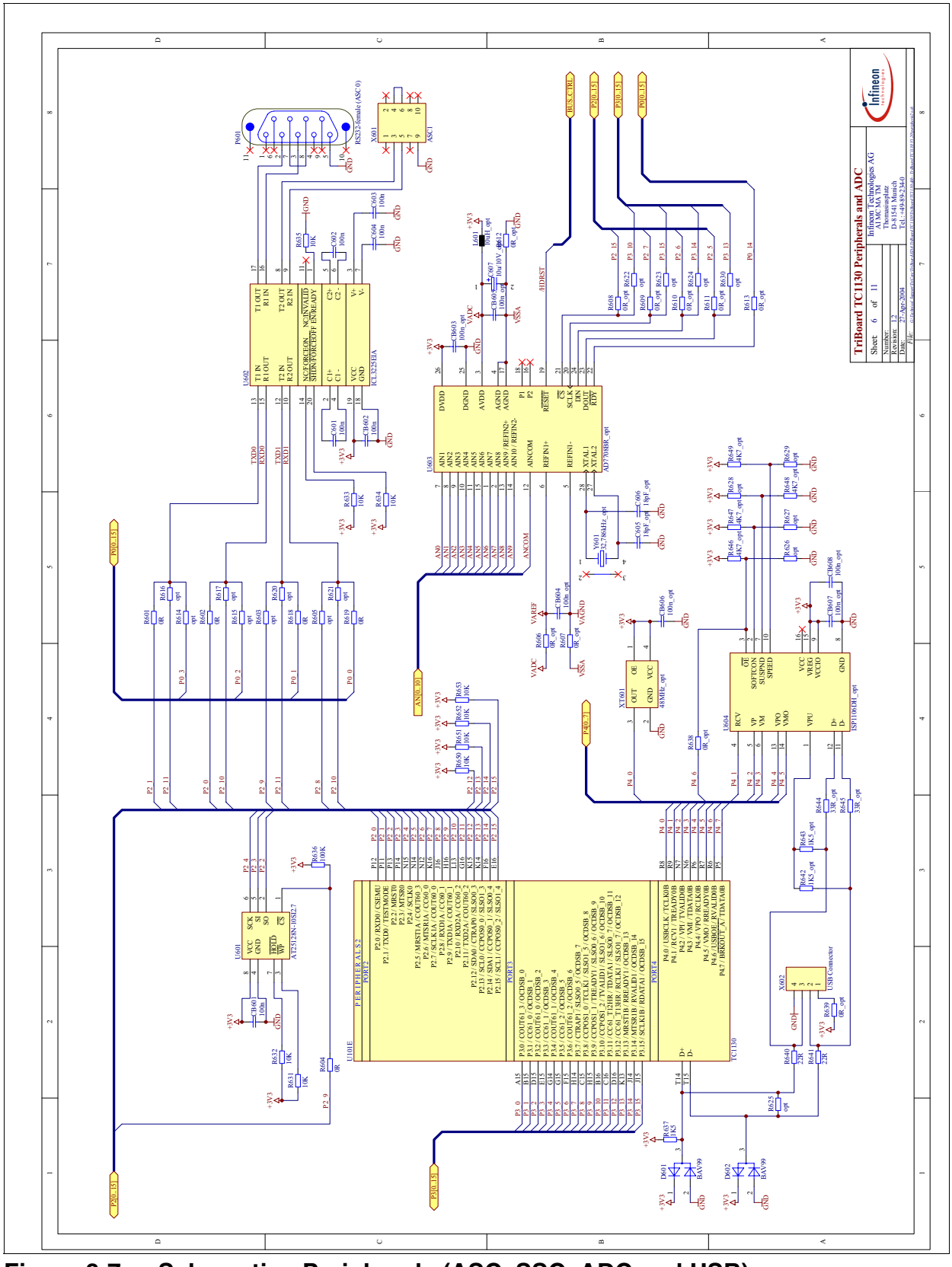

Figure 8-7 Schematic - Peripherals (ASC, SSC, ADC and USB)

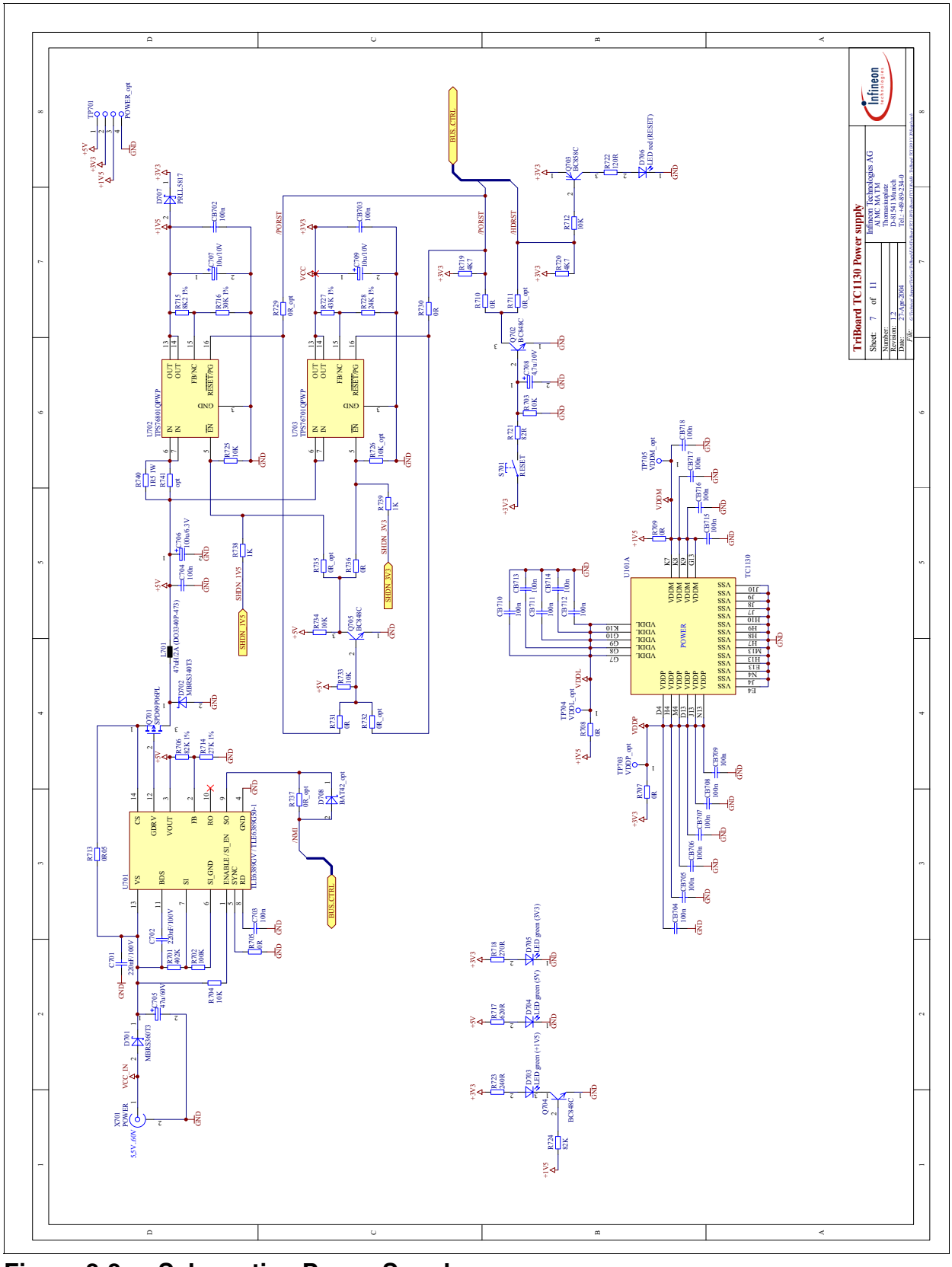

Figure 8-8 Schematic - Power Supply

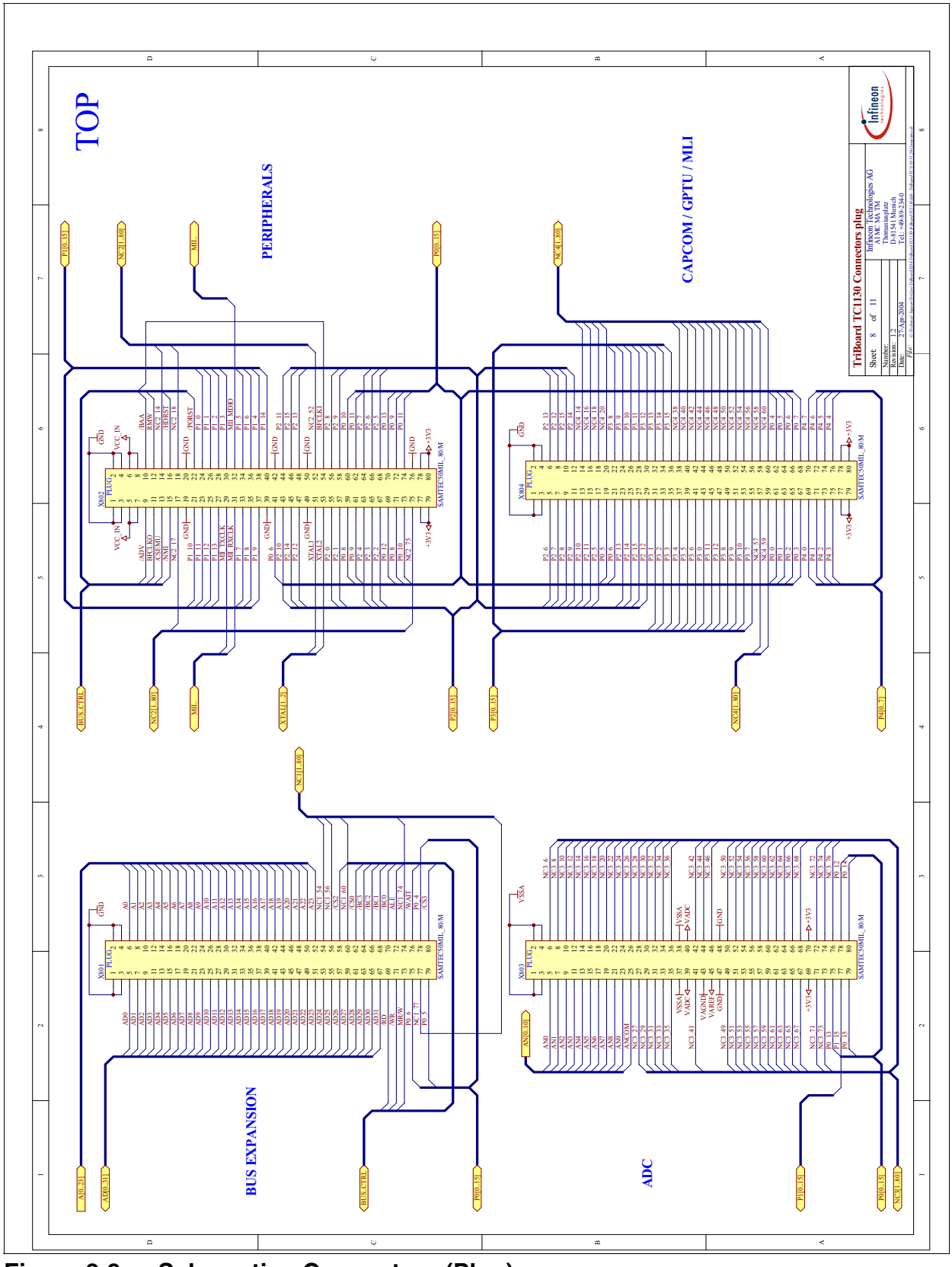

Figure 8-9 Schematic - Connectors (Plug)

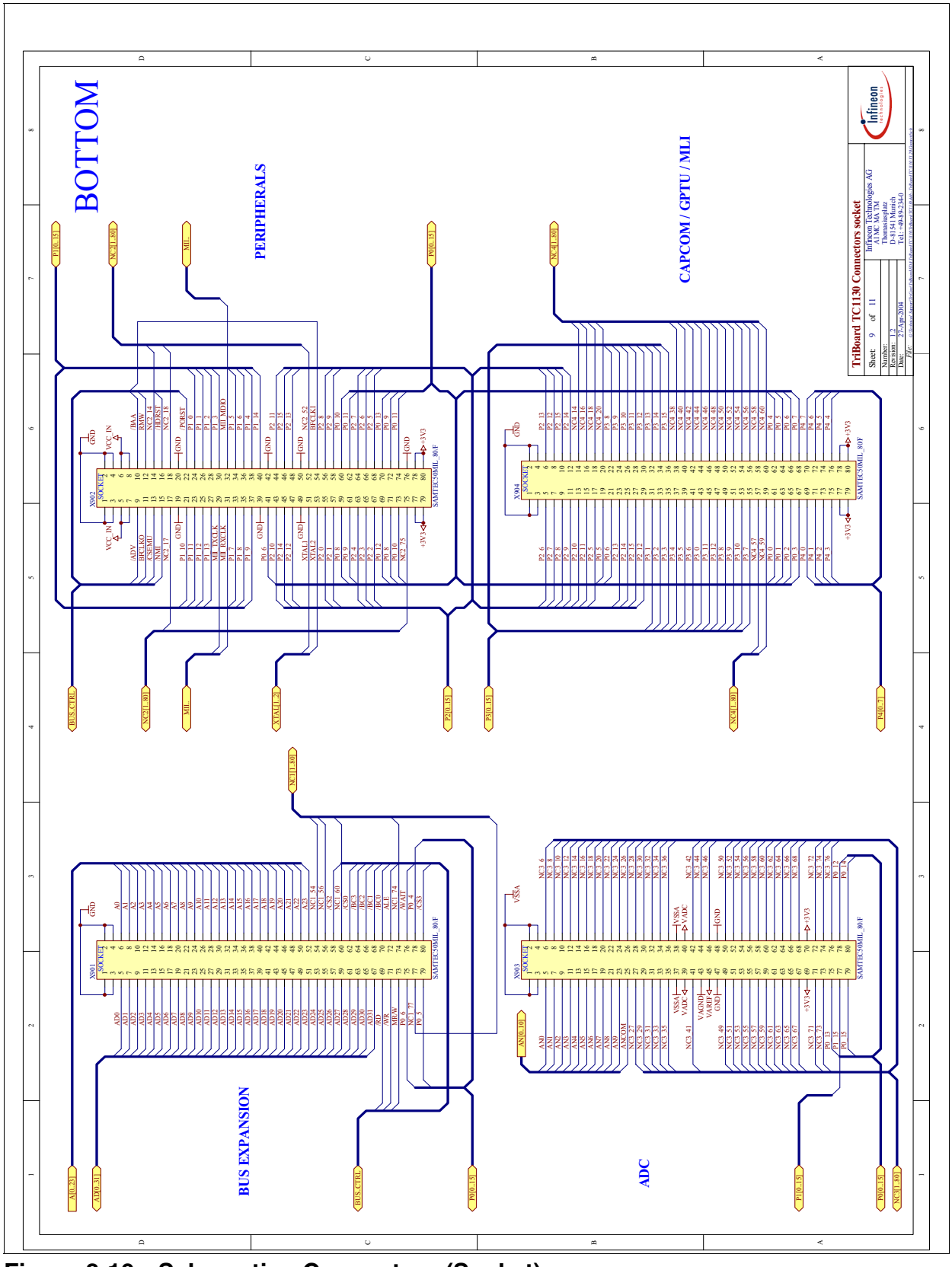

Figure 8-10 Schematic - Connectors (Socket)

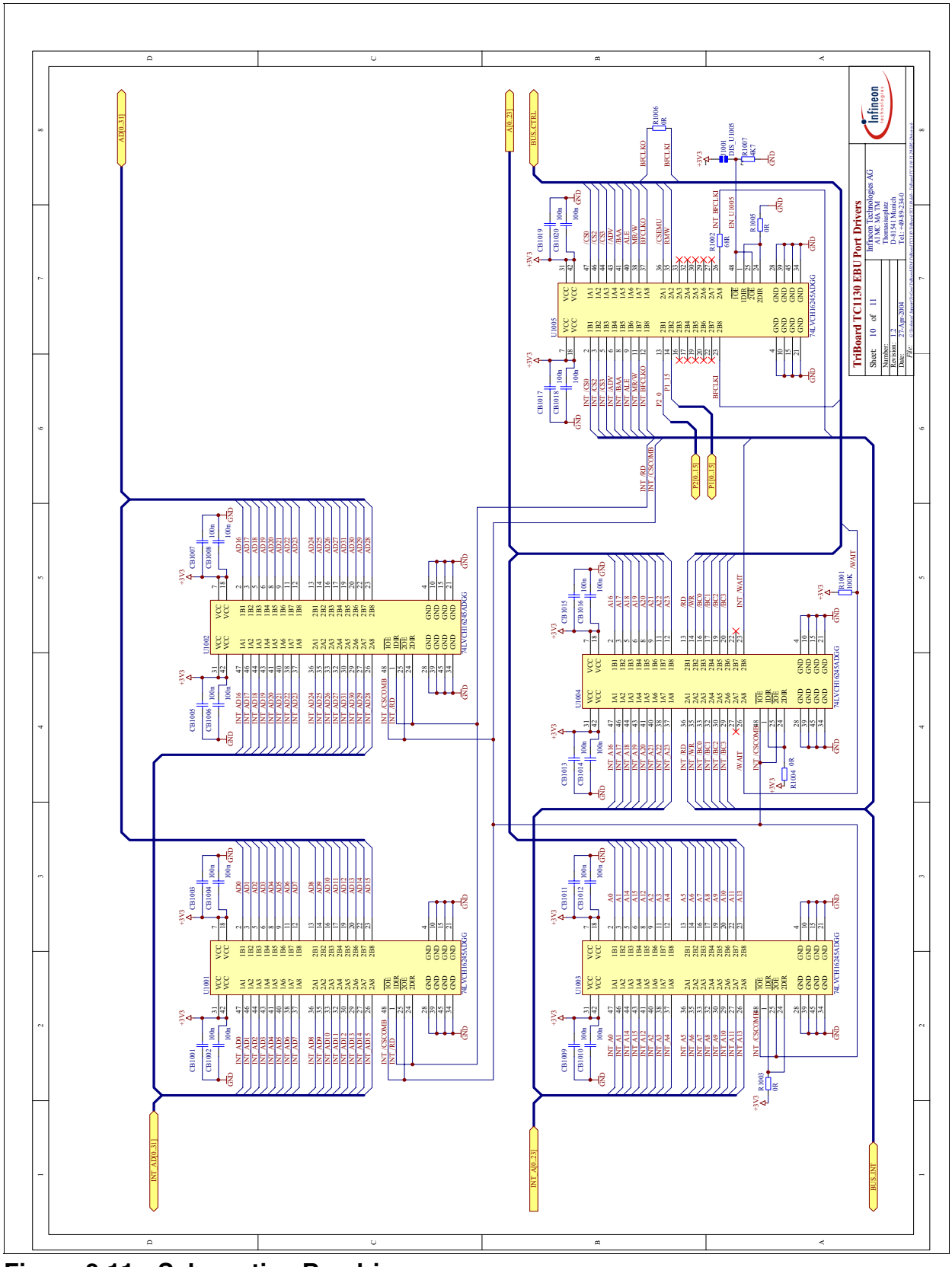

Figure 8-11 Schematic - Busdriver

8.2 Layout

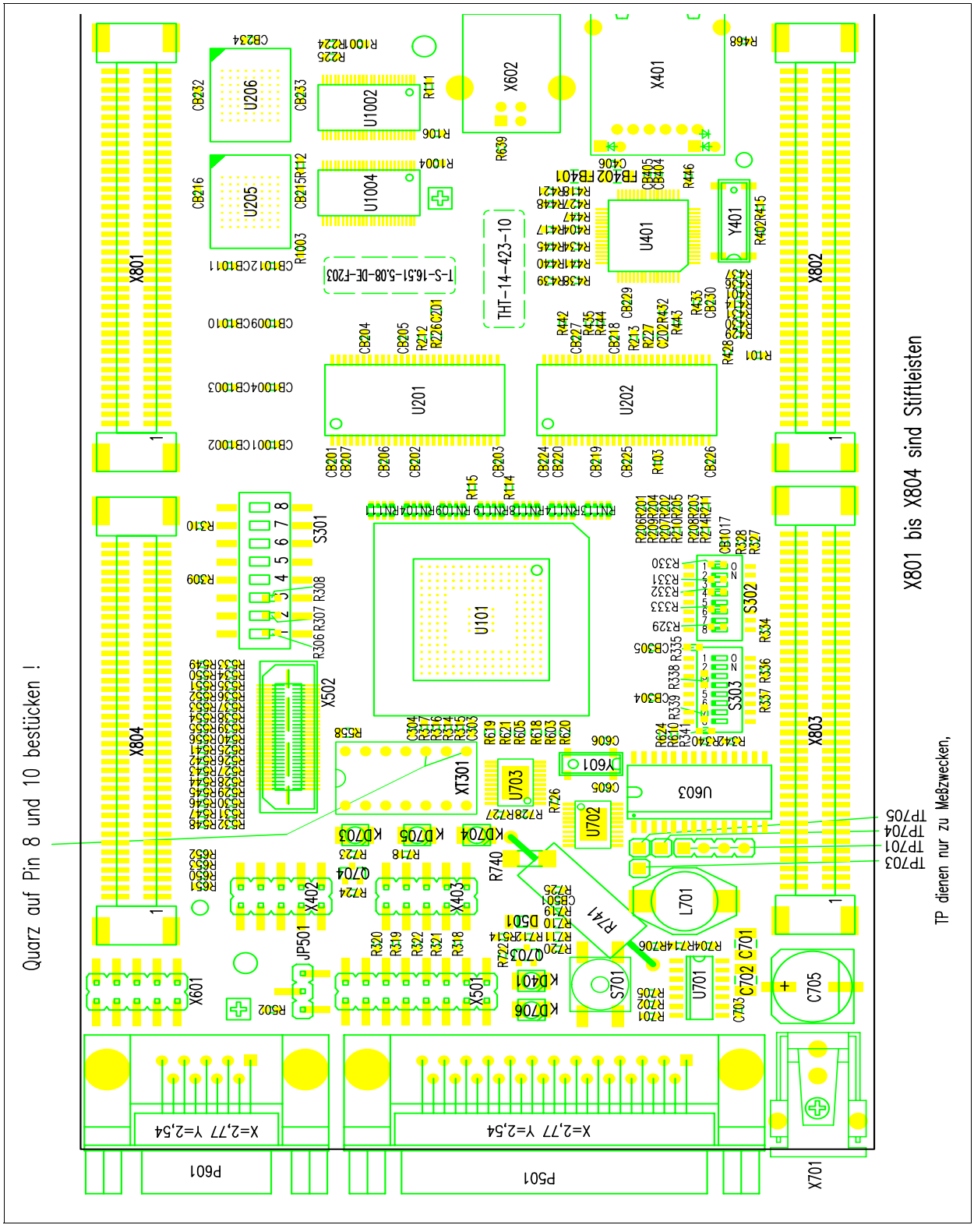

Figure 8-12 Component Plot Top Layer

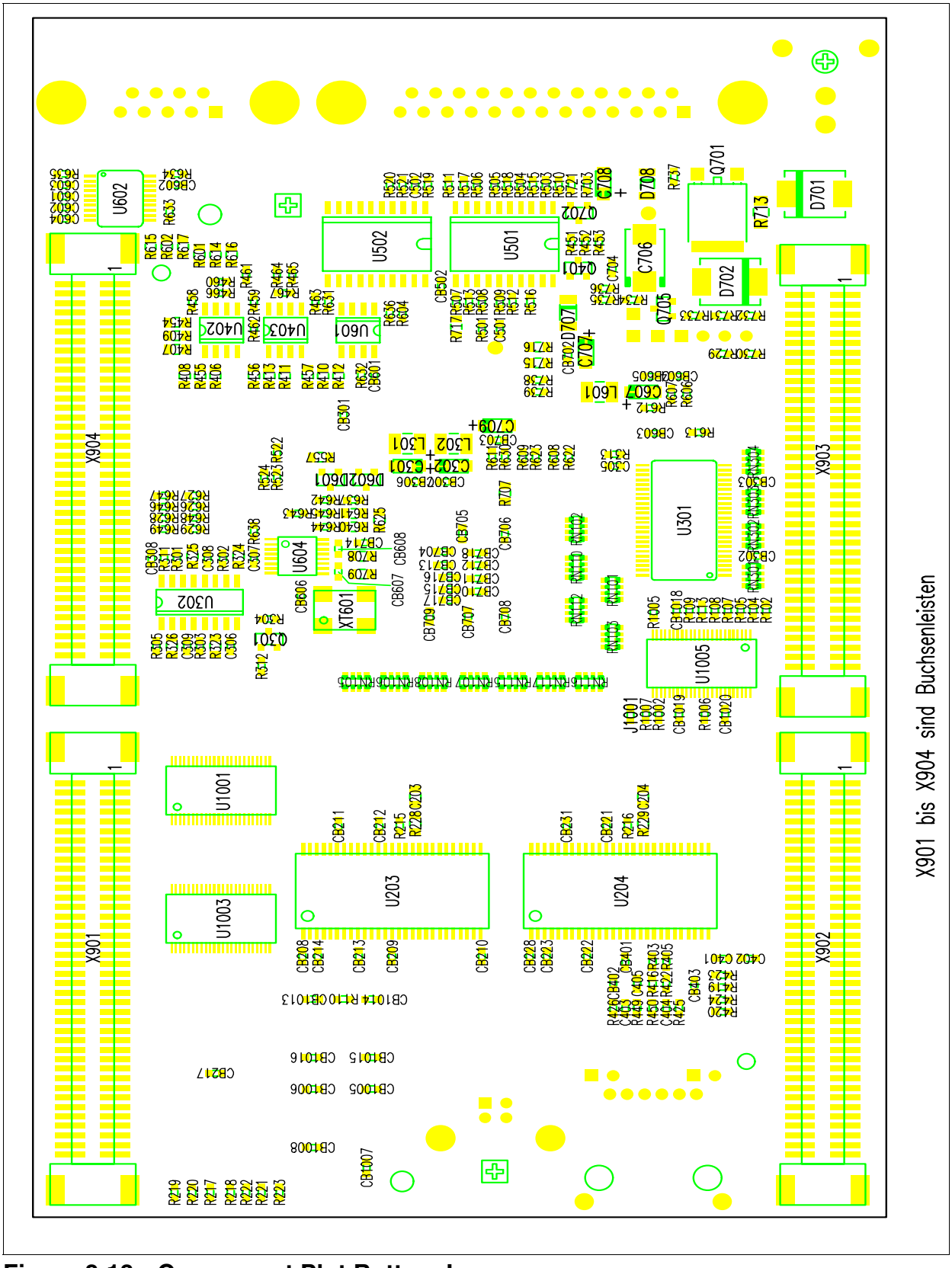

Figure 8-13 Component Plot Bottom Layer

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.

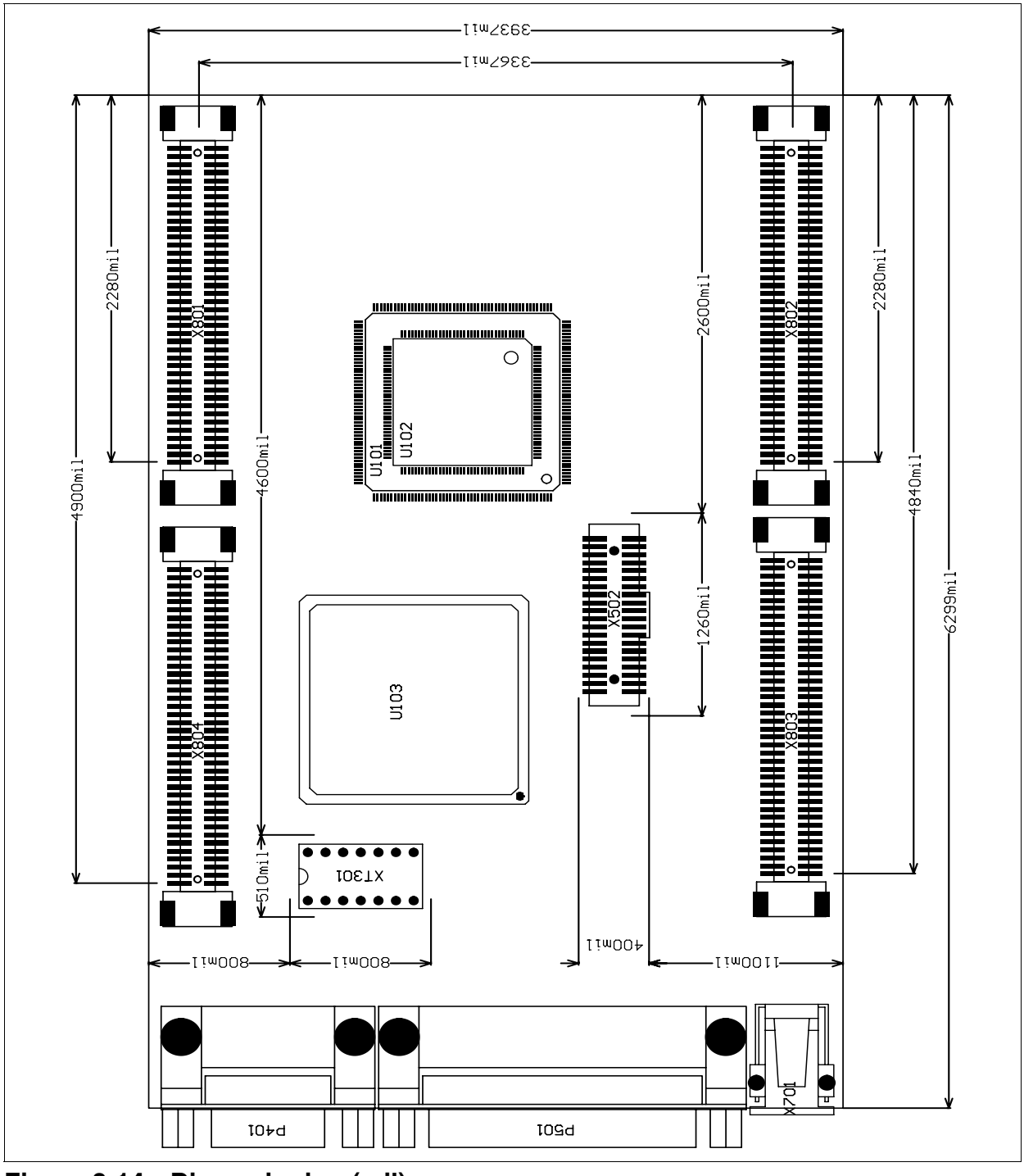

Figure 8-14 Dimensioning (mil)

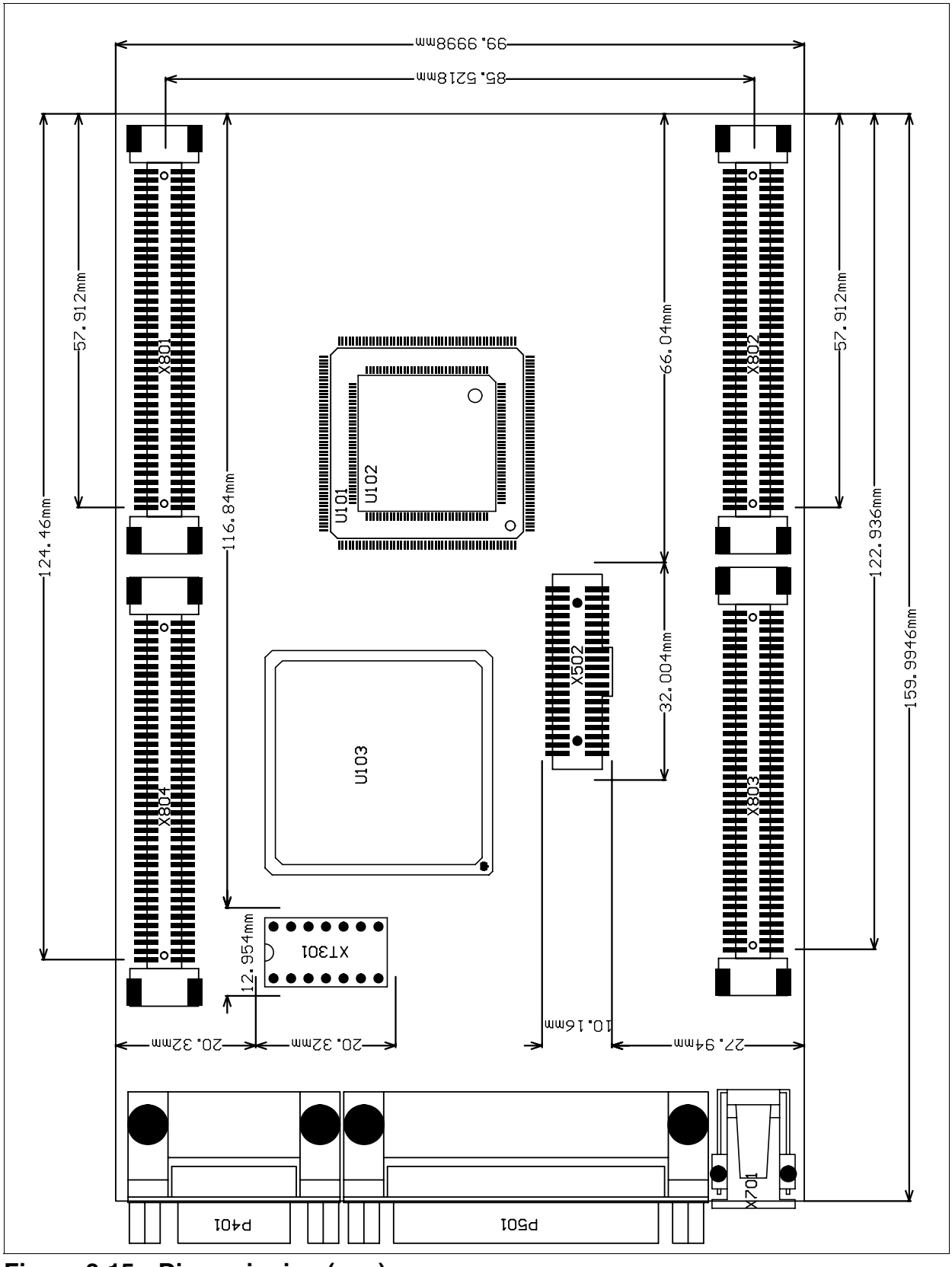

Figure 8-15 Dimensioning (mm)

9 Keyword Index

This section lists a number of keywords which refer to specific details of the TriBoard TC1130 in terms of its architecture, its functional units or functions. This helps to quickly find the answer to specific questions about the TriBoard TC1130.

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