User Manual

32

RH850 Evaluation Platform

RH850/E2x-373BGA PiggyBack board V3

Y-RH850-E2X-373PIN-PB-T1-V3

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Chapter 1 Introduction

The RH850/E2x Application Board is part of the RH850 Evaluation Platform and serves as a simple and easy to use platform for evaluating the features and performance of Renesas Electronics 32-bit RH850/E2x microcontrollers in a BGA-373 package. The PiggyBack board (Y-RH850-E2X-373PIN-PB-T1 –V3) can be used as a standalone board, or can be mated with a mainboard (Y-RH850-X1X-MB-Tx-Vx) for extended functionality.

Main features:

- Socket for mounting of device
- Standalone operation of the board
- Direct supply of device voltage (typ. 5V, 3.3V and 1.12V/1.28V) enabling single power supply and dual power supply
- Device programming capability
- Device debugging capability
- Pin headers for direct access to each functional device pin
- Reset switch
- MainOSC circuitry
- Connectors to MainBoard
- Operating temperature from 0°C to +40°C

This document describes the functionality provided by the PiggyBack board and guides the user through its operation.

For details regarding the operation of the microcontroller, refer to the corresponding User's Manual.

Main differences to V2 (Y-RH850-E2X-373PIN-PB-T1 –V2)

- Support of 28nm devices with 1.12V VDD
- Flexible configuration of RHSIF I/F to support direct board to board communication
- Flexible configuration of EVTI signal
- Change to toggle type reset switch
- Change of power configuration jumpers to comply with the E2x specification
- CAN5 support

Chapter 2 Overview

2.1 Overview of Y-RH850-E2X-373PIN-PB-T1-V3

Figures 1 and 2 provide a schematic view of the Y-RH850-E2X-373PIN-PB-T1-V3 PiggyBack board.

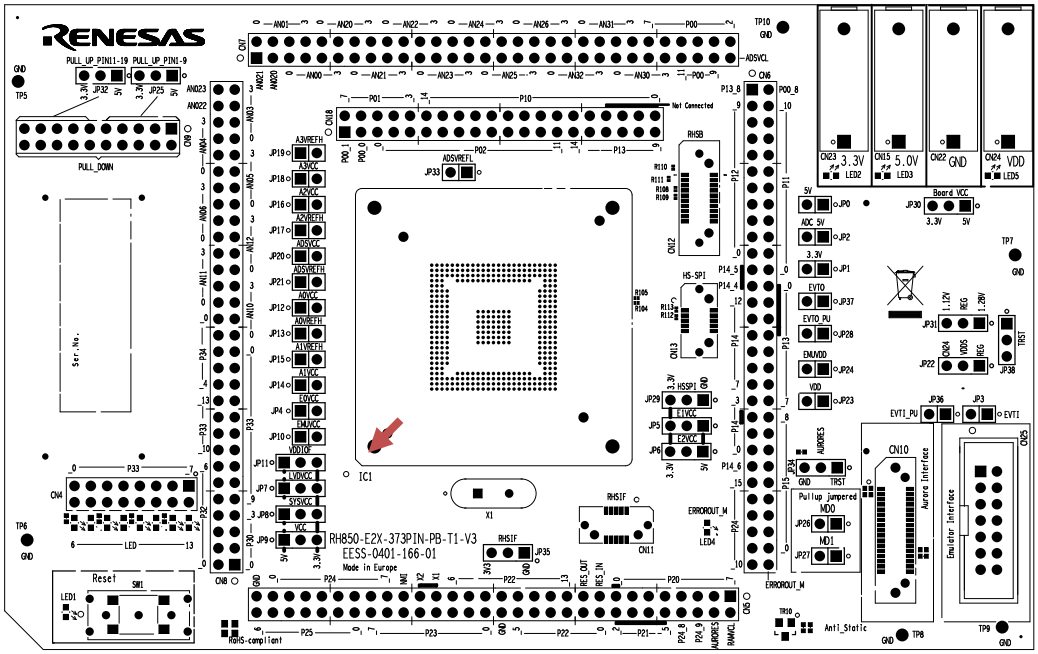


Figure 1 PiggyBack Board Top View

The red arrow denotes the position of socket pin #1.

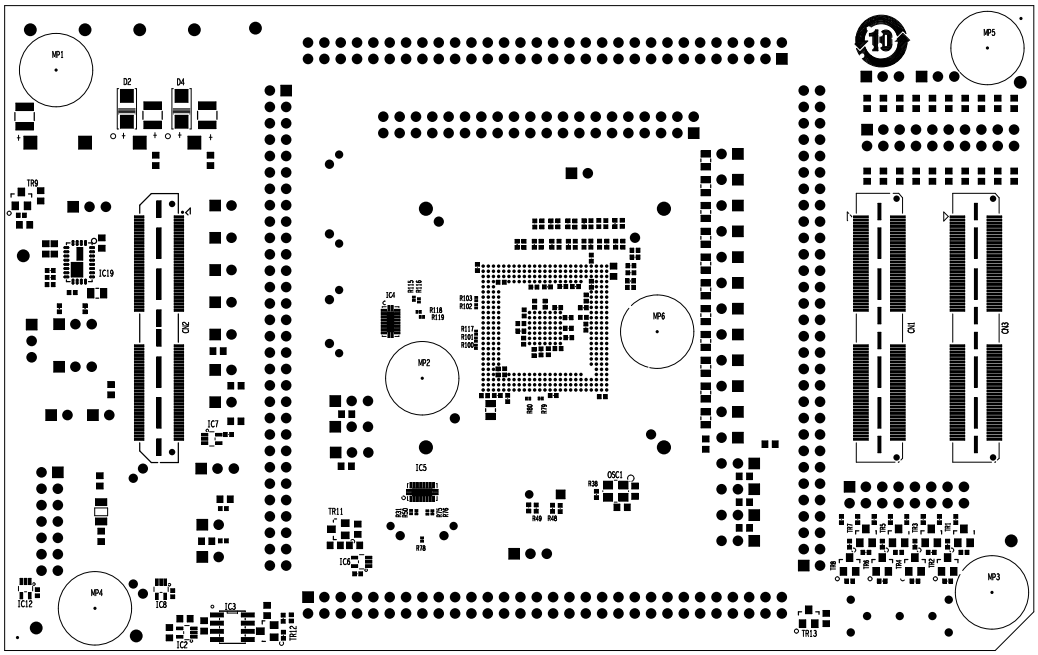


Figure 2 PiggyBack Board Bottom View

2.2 Mounting of the device

The Y-RH850-E2X-373PIN-PB-T1-V3 PiggyBack board features a socket for mounting of the device. All E2x in BGA-373 package do fit into the available Enplas OTB-373(961RS)-0.8-022S-00 socket, except the following RH850/E2x-FCC1 devices:

- R7F702Z02EDBA

For these devices, please refer to the Y-RH850-E2X-373PIN-PB-T1-V1 board.

The device must be placed inside the socket IC1. To insert the device, align the device package #1pin with the #1pin of the socket. The #1pin of the socket is marked with a circle near to the “IC1” label (see also red arrow in **Figure 1**). The #1pin of the device is marked by a white triangle on the package (see white circle in **Figure 3**).

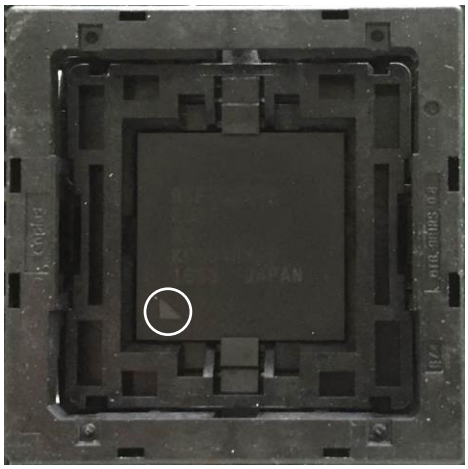


Figure 3 Enplas OTP-373(961RS)-0.8-022S-00 Socket with Mounted Device

CAUTION: *Please be careful with the placement to not damage the device.*

Chapter 3 Power supply

3.1 Board power connection

For operation of the device, a supply voltage must be connected to the board. There are several possibilities to power the device.

Within this document the following voltages are considered as ‘typical’ values:

Voltage1 = 5V

Voltage2 = 3.3V

Voltage3 = 1.12V or 1.28V

Note: The typical core voltages for VDD are higher for this PiggyBack board than the ones specified in the UM (1.09V or 1.25V). With this sufficient high voltage is applied, even in case of any possible voltage drops.

Direct voltage supply

Three different voltages can be supplied to the board.

The following connectors are available to supply those voltages directly:

- Four 4mm ‘banana-type’ connectors:
  - Three red connectors for voltages 5V (CN15), 3.3V (CN23) and 1.12V/1.25V (CN24).
  - A black connector for ground (GND) connection (CN22).
  Note: The four connectors are supplied with the board but not assembled.

For details about voltage distribution, refer to **Chapter 3.2 ‘Voltage distribution’**.

Supply by MainBoard

In case the PiggyBack board is mounted on a MainBoard, the 5V and 3.3V is supplied by the on-board regulator of the MainBoard.

CAUTION: *Do not supply 5V or 3.3V directly to the PiggyBack board in case it is mounted on the MainBoard.*

For each of the voltages, 5V, 3.3V and 1.12V/1.28V a green LED (LED3, LED2 and LED5, respectively) is available to signal that the related voltage is available on the PiggyBack board. The corresponding LEDs are placed directly beneath the connectors of the related voltage.

3.2 Voltage distribution

The table shows the required device power supply pins and their function. For detailed explanation of their function and specification, please refer to the user documentation of the corresponding device:

Table 1 Available Power Domains for MCU

Device Supply Pin
SYSVCC
VCC
EnVCC (n = 0-2)
LVDVCC
EMUVCC
AnVCC (n = 0-3)
AnVREFH (n = 0-3)
ADSVCC
ADSVREFH
EMUVDD
VDD

Additional power supply for the MainBoard and the operation of the PiggyBack board can be selected:

Table 2 Available Power Domains for Board Operation

Supply voltage	Function
VDDIOF	IO supply voltage for components located on a connected mainboard.
Board_VCC	Source for all devices (e.g. voltage regulator) on the PiggyBack board

The following figure shows the configurable voltage distribution on the PiggyBack board.

- Jumpers can interrupt all power supply lines. This provides the possibility to measure the current consumption of each individual power domain of the device (JP4 – 10, JP12 – 21 and JP23 – 24).
- The IO supply voltage for the Mainboard (VDDIOF) can be connected via jumper JP11 to 5V or 3.3V, if the PiggyBack board is mounted on a MainBoard.
- VDD and EMUVDD can be powered either directly from the ‘banana-type’ connector (CN24) or by an on-board voltage regulator.
- The source for the on-board voltage regulator, as well as the source for all on-board devices (Board_VCC) needs to be configured via jumper JP30 to either 5V or 3.3V.
- The source for VDD is selectable by the jumper JP22. The jumper JP23 and JP24 connect the voltage, configured by JP22 with the VDD and EMUVDD pins.

- Jumper JP31 configures the output voltage of the regulator IC19. Connecting pin 1-2 sets the voltage to 1.28V, while connecting pin 2-3 results in 1.12V output.

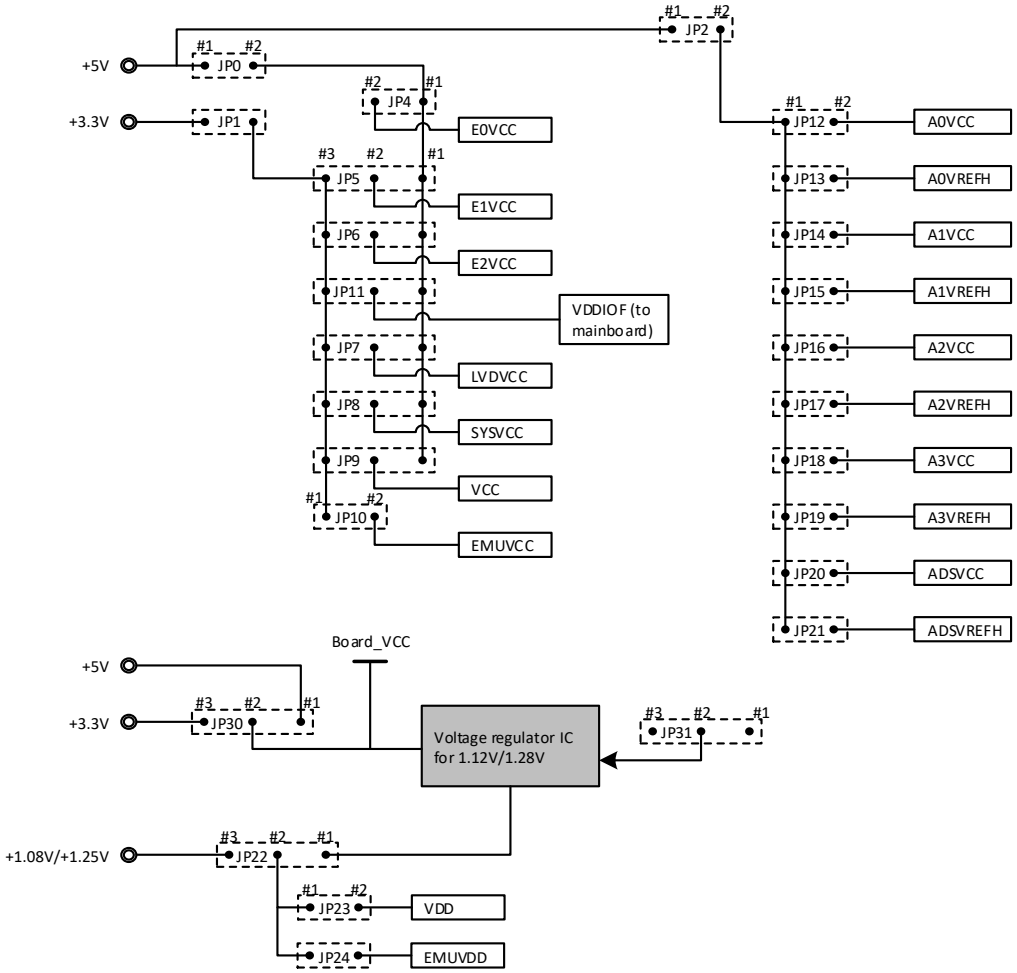


Figure 4 Voltage Distribution on the PiggyBack Board

For more details, please refer to **Chapter 11 'Schematic'**. For typical configuration of the jumpers, please refer to **Chapter 8 'Jumper Configuration'**.

Chapter 4 Clock sources

External crystal oscillators for the device clock supply are provided with the board.

4.1.1 MainOsc

A crystal or ceramic resonator can be mounted on socket X1.

A 20Mhz and 40MHz oscillator are supplied with the board.

The signals X1 and X2 are by default not connected to a pin header in order to minimize disturbance on the resonator signal. If needed the signals can be connected to CN5 (pins #37 and 39) via connecting with 0Ohm resistances R48 and R49. For details, please refer to **Chapter 11 'Schematic'**.

4.1.2 Programmable Oscillator

It is possible to mount a programmable crystal oscillator on the PiggyBack board at OSC1. The available footprint and circuitry is designed for a SG-8002CE programmable crystal oscillator from Epson Toyocom. The output from this oscillator can be connected to port X1 via resistor R38. The SG-8002CE is neither mounted nor provided with the board. For details about the available circuitry, refer to **Chapter 11 'Schematic'**. A resonator mounted on socket X1 must not be used in parallel to another clock source.

Chapter 5 Debug and Programming interface

The signal ‘EVTO’ from below connectors can be pulled up to ‘E0VCC’ via JP28. Please refer to the documentation of the used tool, whether this is needed. To use the ‘EVTO’ function P33_9 must be connected via JP37.

The signal ‘TRST’ from below connectors can be pulled up to ‘SYSVCC’ or to the ‘TRST’ line of the used tool via jumper JP31.

For typical configuration of the jumpers, please refer to **Chapter 8 ‘Jumper Configuration’**.

5.1 14 Pin Debug Connector

For connection of the microcontroller to debug and flash programming tools, the connector CN25 with fourteen pins is available.

The signal connection of the connector CN25 is shown in the table below:

Table 3 Pin Assignment of CN25

CN25 Pin	Function
1	TCK
2	GND
3	JP31 #3
4	MD0
5	TDO
6	-
7	TDI
8	VCC
9	TMS
10	EVTO (P33_9)
11	DRDY
12	GND
13	RES_IN
14	GND

5.2 34 Pin Aurora Connector

For connection of the microcontroller to a trace tool CN10 is available.

The signal connection of the connector CN10 is shown in the table below:

Table 4 Pin Assignment of CN10

CN10 Pin	Function		CN10 Pin	Function
1	TODP0		2	VCC

3	TODN0		4	TCK
5	GND		6	TMS
7	Reserved (NC)		8	TDI
9	Reserved (NC)		10	TDO
11	GND		12	TRST
13	Reserved (NC)		14	MD0
15	Reserved (NC)		16	EVTI (P33_8)*1)
17	GND		18	EVTO (P33_9)*2)
19	Reserved (NC)		20	MD1
21	Reserved (NC)		22	RES_IN
23	GND		24	GND
25	Reserved (NC		26	CICREFP
27	WDTDIS (NC)		28	CICREFN
29	GND		30	GND
31	ETK-BREQ (NC)		32	DRDY
33	ETK-BGNT (NC)		34	RES_OUT

Note 1): For connecting CN10 pin #16 with the pin P33_8 of the MCU JP3 needs to be closed. Please note that additionally P33_8 port function needs to be assigned to EVTI.

Note 2): For connecting CN10 pin #17 with the pin P33_9 of the MCU JP37 needs to be closed. Please note that additionally P33_9 port function needs to be assigned to EVTO.

Access to the signal AURORES is possible via JP34. With this jumper AURORES can also be connected to TRST or pulled-down to GND.

Chapter 6 Connectors for ports of device

Connection to most functional pins of the devices is possible via the connectors CN5 to CN8 and CN18.
Some functions might not be available on the pin headers, e.g. high frequency signals, as this would disturb the integrity of such signals. The actual voltage levels of the various voltage domains can be measured at the individual jumpers. For more details, please refer to **sec. 3.2 'Voltage distribution'** and **Chapter 11 'Schematic'.**

CAUTION: *The pin headers are directly connected to the pins of the device, therefore special care must be taken to avoid any electrostatic or other damage to the device.*

6.1 Toggle Switch for RESET

To issue a RESET to the device, the toggle switch SW1 is available.

The switch is a Nidec Copal Electronics Miniature Toggle Switch 'BT1H-2M4-Z' with two positions to issue a RESET.

The switching function is depicted in **Figure 5**. To issue a RESET to the device the switch needs to be toggled either to the left or to the right side. To the right side – 'ON' – a static RESET can be applied, while on the left side – '(ON)' – a momentary RESET is applied and the switch will return into the 'OFF' position again. Please note that the position of the switch is defined from the side of the part number marking, which is highlighted with a red arrow.

Switching function / Part No.	Viewed from part No. marking side		
★BT1H-2M4-Z	(ON)	OFF	ON
Connecting terminals	2—1	—	2—3

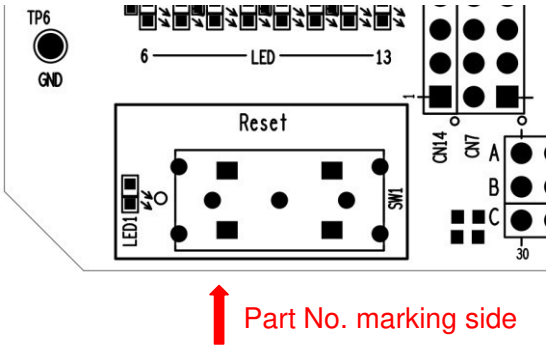


Figure 5 RESET Switching Function

LED1 is indicating the function of the switch, i.e. LED1 illuminates when the RESET is asserted by the switch. Please note that LED1 cannot indicate a RESET by another source e.g. a connected tool.

6.2 Mode Selection

The PiggyBack Board gives the possibility to configure the following mode pins

- MD0 via jumper JP26

- MD1 via jumper JP27

To apply “High” to the mode pins, the corresponding jumpers can be set.

CAUTION: *Be careful in configuration of mode related pins, as wrong configuration can cause irregular behavior of the devices. Be sure to check the corresponding User’s Manual for details, which modes can be selected for the used device.*

6.3 Connectors to MainBoard

Three connectors (CN1, CN2 and CN3) are available to connect the PiggyBack board to a MainBoard. Regarding the function on the MainBoard, please refer to the UM of any supported MainBoard (Y-RH850-X1X-MB-Tx-Vx).

For details about the signal assignment to the connectors, please refer to **Chapter 11 ’Schematic’**.

6.3.1 Assignment of CAN Pins

The available Mainboards (Y-RH850-X1X-MB-Tx-Vx) provide connectors for CAN communication. The channel number of the Mainboards does not necessarily match the channel number of RH850/E2x devices.

The following table shows the assignment.

Table 5 CAN Function Assignment

Mainboard	PiggyBack Board (MCU)	
	Port Pin	CAN Alternative Function
CAN0TX	P32_1	CTX2
CAN0RX	P32_0	CRX2
CAN1TX	P15_2	CTX1
CAN1RX	P15_1	CRX1
CAN2TX	P02_0	CTX0
CAN2RX	P02_2	CRX0
CAN3TX	P32_6	CTX3
CAN3RX	P32_4	CRX3
CAN4TX	P15_7	CTX4
CAN4RX	P15_8	CRX4
CAN5TX*1	P15_5	CTX5
CAN5RX*1	P15_3	CRX5

Note 1: Not available on all RH850/E2x devices in BGA373 package. Please refer to the UM of the used device for specification.
Please also refer to sec. **9.3 ‘Connection of CAN5 to the Mainboard’** to check the availability of the connection on your board.

6.4 RHSIF I/F

CN11 is available to connect to the RHSIF I/F signals of the device. The connector is a Samtec 'ERF8-005-05.0-L-DV-L-TR' type connector and the following table shows the signal assignment.

Table 6 RHSIF I/F Pin Assignment

CN11 Pin	Function*1	Device Pin*1	Function*2	Device Pin*2		CN11 Pin	Function	Device Pin
1	HSIF0_TXDP	P21_5	HSIF0_RXDP	P21_3		2	GND	-
3	HSIF0_TXDN	P21_4	HSIF0_RXDN	P21_2		4	GND	-
5	GND	-	GND	-		6	HSIF0_REFCLK	P20_0
7	HSIF0_RXDP	P21_3	HSIF0_TXDP	P21_5		8	GND	-
9	HSIF0_RXDN	P21_2	HSIF0_TXDN	P21_4		10	GND	-

Note 1 & 2: The function of CN11 pins 1, 3, 7 and 9 depend on the configuration of JP35

- JP35 pins 1 and 2 connected: Function *1 is effective
- JP35 pins 2 and 3 connected: Function *2 is effective

All signals are by default not connected to a pin header to minimize disturbance on the signal. If needed the signals can be connected to CN5 (pins #10, 12 and 14 – 16) via connecting with 0Ohm resistances R31, R50, R75, R76 and R78. For details, please refer to **Chapter 11 'Schematic'**.

6.5 HS-SPI I/F

CN13 is available to connect to the HS-SPI I/F signals of the device. The connector is a Samtec 'ERF8-005-05.0-L-DV-L-TR' type connector and the following table shows the signal assignment.

Table 7 HS-SPI I/F Pin Assignment

CN13 Pin	Function	Device Pin		CN13 Pin	Function*1	Device Pin*1	Function*2	Device Pin*2
1	CLKP	P13_1		2	TXDP	P13_3	RXDP	P14_4
3	CLKN	P13_0		4	TXDN	P13_2	RXDN	P14_5
5	GND	-		6	GND	-	GND	-
7	GND	-		8	RXDP	P14_4	TXDP	P13_3
9	SSL/SSLI*3	P14_2		10	RXDN	P14_5	TXDN	P13_2

Note 1 & 2: The function of CN13 pins 2, 4, 8 and 10 depend on the configuration of JP29

- JP29 pins 1 and 2 connected: Function *1 is effective
- JP29 pins 2 and 3 connected: Function *2 is effective

Note 3: The function of the pin P14_2 can be configured in the used MCU device. For details, please refer to the HW user's manual of the used device.

All signals are by default not connected to a pin header to minimize disturbance on the signal. If needed the signals can be connected to CN6 (pins #23, 25, 26, 28, 30, 32 and 41) via connecting with 0Ohm resistances R112 – R116, R118 and R119. For details, please refer to **Chapter 11 'Schematic'**.

6.6 RHSB I/F

CN12 is available to connect to the HS-SPI I/F signals of the device. The connector is a Samtec 'ERF8-010-05.0-L-DV-L-TR' type connector and the following table shows the signal assignment

Table 8 RHSB I/F Pin Assignment

CN12 Pin	Function	Device Pin	CN12 Pin	Function	Device Pin
1	RHSB1FCLN	P10_1	2	RHSB1CSD0	P10_7
3	RHSB1FCLP	P10_0	4	RHSB1EMRG	P12_0
5	GND	-	6	RHSB1SI0	P12_2
7	RHSB1SON	P10_3	8	RHSB1SI1	P12_4
9	RHSB1SOP	P10_2	10	RHSB1CSD1	P10_6
11	RHSB0FCLN	P13_0	12	RHSB0CSD0	P14_7
13	RHSB0FCLP	P13_1	14	RHSB0EMRG	P12_7
15	GND	-	16	RHSB0SI0	P12_3
17	RHSB0SON	P13_2*1	18	RHSB0SI1	P12_1
19	RHSB0SOP	P13_3*1	20	RHSB0CSD1	P12_5

Note 1: By default, these signals are not directly connected to the corresponding device pins. To use these signals for the RHSB I/F CN12 pins #17 and #19 must be connected to the device via 0Ohm resistances R104 and R105. In case of using the HS-SPI I/F (refer to section **6.5**), it is recommended to not apply the latter resistances. This it to minimize signal disturbance. For details, please refer to **Chapter 11 'Schematic'**.

The signals assigned to CN12 pins #1, 3, 7, 9, 17 and 19 are by default not connected to a pin header to minimize disturbance on the signal. If needed the signals can be connected to CN6 (pins #30 and 32) and CN18 (pins #34, 36, 38 and 40) via connecting with 0Ohm resistances R108 – R111 and R115 and R116. Please also consider above note 1. For details, please refer to **Chapter 11 'Schematic'**.

Chapter 7 Other circuitry

7.1 Signaling for ERROROUT_M

A red LED (LED4) is available two indicate a “low” output signal from ERROROUT_M.

7.2 Pin Headers for Pull-Down and Pull-Up

A connector CN9 is available to enable easy connection to 3.3V / 5V or GND via pull-up or pull-down resistances, respectively.

Hereby uneven pins from 1 to 19 (in total ten) are configured as pull-up pin headers, while the even numbers from 2 to 20 (in total ten) can be used for pull-down. JP25 and JP32 configure the voltage connected to the uneven pins to 3.3V or 5V. JP25 configures uneven pins 1 – 9 and JP32 configures uneven pins 11 – 19.

By connecting device port pins from CN5 – 8 to CN9 it is therefore possible to pull a desired port pin to “Low” or “High”.

7.3 Signaling LEDs

Eight LEDs are provided to allow visual observation of the output state of device pins. Device pins P33_0 to P33_7 are connected to the uneven pins 15 to 1 of the pin header CN4, while the LEDs 6 to 13 are connected to the even pins 16 to 2, respectively. Thus, the LEDs can be connected to the device port pins P33_0 to P33_7 via jumper or to any device port pin by connecting directly to the even pin headers of CN4.

Chapter 8 Jumper Configuration

Jumper are available to configure the function of the board. This chapter describes the standard configuration, i.e. jumper setting for the intended devices, to enable basic operation. For a detailed explanation of the supported function of the used device, please refer to the corresponding HW user's manual.

Table 9 Recommended Jumper Settings

Purpose	Jumper #	Device			
		RH850/E2M in BGA373		RH850/E2H in BGA373	
		FCC1 for E2M	E2M	FCC2 for E2H	E2H
5.0V Main	0	o	o	o	o
3.3V Main*1)	1	o (opt)	- (opt)	o (opt)	- (opt)
5.0V Analog Main	2	o	o	o	o
EVTI Connect*2)	3	- (opt)	- (opt)	- (opt)	- (opt)
E0VCC	4	o	o	o	o
E1VCC Config	5	#1-#2	#1-#2	#1-#2	#1-#2
E2VCC Config	6	#1-#2	#1-#2	#1-#2	#1-#2
LVDVCC Config	7	#1-#2	#1-#2	#1-#2	#1-#2
SYSVCC Config	8	#1-#2	#1-#2	#1-#2	#1-#2
VCC Config	9	#1-#2	#1-#2	#1-#2	#1-#2
EMUVCC*1)	10	o (opt)	-	o (opt)	-
VDDIOF	11	#1-#2	#1-#2	#1-#2	#1-#2
A0VCC	12	o	o	o	o
A0VREFH	13	o	o	o	o
A1VCC	14	o	o	o	o
A1VREFH	15	o	o	o	o
A2VCC	16	o	o	o	o
A2VREFH	17	o	o	o	o
A3VCC	18	o	o	o	o
A3VREFH	19	o	o	o	o
ADSVCC	20	o	o	o	o
ADSVREFH	21	o	o	o	o
1.12V/1.28V Source	22	#1-#2	#1-#2	#1-#2	#1-#2
VDD	23	o	o	o	o
EMUVDD*1)	24	o (opt)	-	o (opt)	-
CN9 Pull-Up 1-9	25	- (opt)	- (opt)	- (opt)	- (opt)
MD0 Pull-Up	26	- (opt)	- (opt)	- (opt)	- (opt)
MD1 Pull-Up	27	- (opt)	- (opt)	- (opt)	- (opt)
EVTO Pull-Up*2)	28	- (opt)	- (opt)	- (opt)	- (opt)
HS-SPI IC4 Config	29	- (opt)	- (opt)	- (opt)	- (opt)
Board_VCC Config	30	#1-#2	#1-#2	#1-#2	#1-#2
Regulator 1.12V/1.28V Config	31	#1-#2	#1-#2	#2-#3	#2-#3
CN9 Pull-Up 11-19	32	- (opt)	- (opt)	- (opt)	- (opt)
ADSVREFL Pull-Down	33	o	o	o	o

Purpose	Jumper #	Device			
		RH850/E2M in BGA373		RH850/E2H in BGA373	
		FCC1 for E2M	E2M	FCC2 for E2H	E2H
AURORES Config*3)	34	#1-#2 (opt)	#2-#3 only	#1-#2 (opt)	#2-#3 only
RHSIF IC5 Config	35	- (opt)	- (opt)	- (opt)	- (opt)
EVTI Pull-Up*2)	36	- (opt)	- (opt)	- (opt)	- (opt)
EVTO Connect*2)	37	- (opt)	- (opt)	- (opt)	- (opt)
TRST Config	38	#2-#3	#2-#3	#2-#3	#2-#3

Note 1): Optionally for the FCC device only. If any of the FCC specific features are used (e.g. ERAM, Aurora Trace …) these jumpers must to be set.

Note 2): Whether EVTO and/or EVTI signals are supported and need to be pulled up depends on the used tool. Please clarify with your tool vendor about the specification.

Note 3): Optionally for the FCC device only, if Aurora Trace is used. Please refer to the user's documentation of the used tool for dedicated requirement.

The table has the following meaning:

- o: Jumper must be connected.
- o (opt): Recommended to be connected. Can be left open if not necessary for use case
- -: Jumper must be left open
- - (opt): Not mandatory to connect. Can be connected if necessary for use case
- #x-#y: Connect the pins #x and #y for the standard configuration. Possible to configure depending on the use case and on the allowed specification of the used device.

A small circle near the jumper on the board and a rectangular representation of the pin in the overview picture in sec. **2.1** identifies the #1 pin of the jumper.

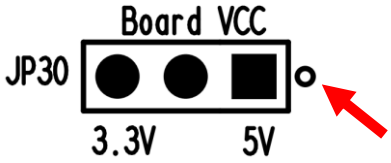


Figure 6 Identifying the Pin #1 at a Jumper

In this example (JP30), the pin #1 is on the right side. The red arrow highlights the marking circle.

Chapter 9 Precautions

9.1 Power-Off Sequence

A dedicated sequence needs to be applied, when the power supplied to the board is turned off.

Please follow below sequence:

1. At first press the reset push-button SW1 and keep the button pushed down (keep the Reset asserted)
2. Turn off the board power supply
3. After power supply is shut down, release the push-button SW1

For details how to apply a RESET, please refer to section **6.1 'Toggle Switch for RESET'**.

9.2 Pin Function Assignment of HS-SPI Pins

To enable HS-SPI communication between two PiggyBack boards some of the signals need to be switched. Thus, the device pins P13_2, P13_3, P14_4 and P14_5 are connected to a differential multiplexer IC (IC4). The inputs of this device are only 3.3V tolerant.

It is therefore not allowed to configure above mentioned pins to GPIO or any alternative functions other than the LVDS functions used on this board.

For details, please refer to section **6.5** and **Chapter 11 'Schematic'**, as well as the corresponding User's Manual of the used device.

9.3 Connection of CAN5 to the Mainboard

On version "EESS-0401-166-01" of the PiggyBack board, the connection between the device and the Mainboard connectors for CAN5 is missing.

To utilize CAN5 with the Mainboard a manual connection must be established on the board.

For the proposed fix the following pins must be connected via cable:

- CN6 #48 (P15_5 – CTX5) with CN2 #6 (CAN5TX on Mainboard)
- CN6 #52 (P15_3 – CRX5) with CN2 #8 (CAN5RX on Mainboard)

The following schematic drawing shows the recommended fix on the bottom side of the Board (also compare with sec. **2.1**).

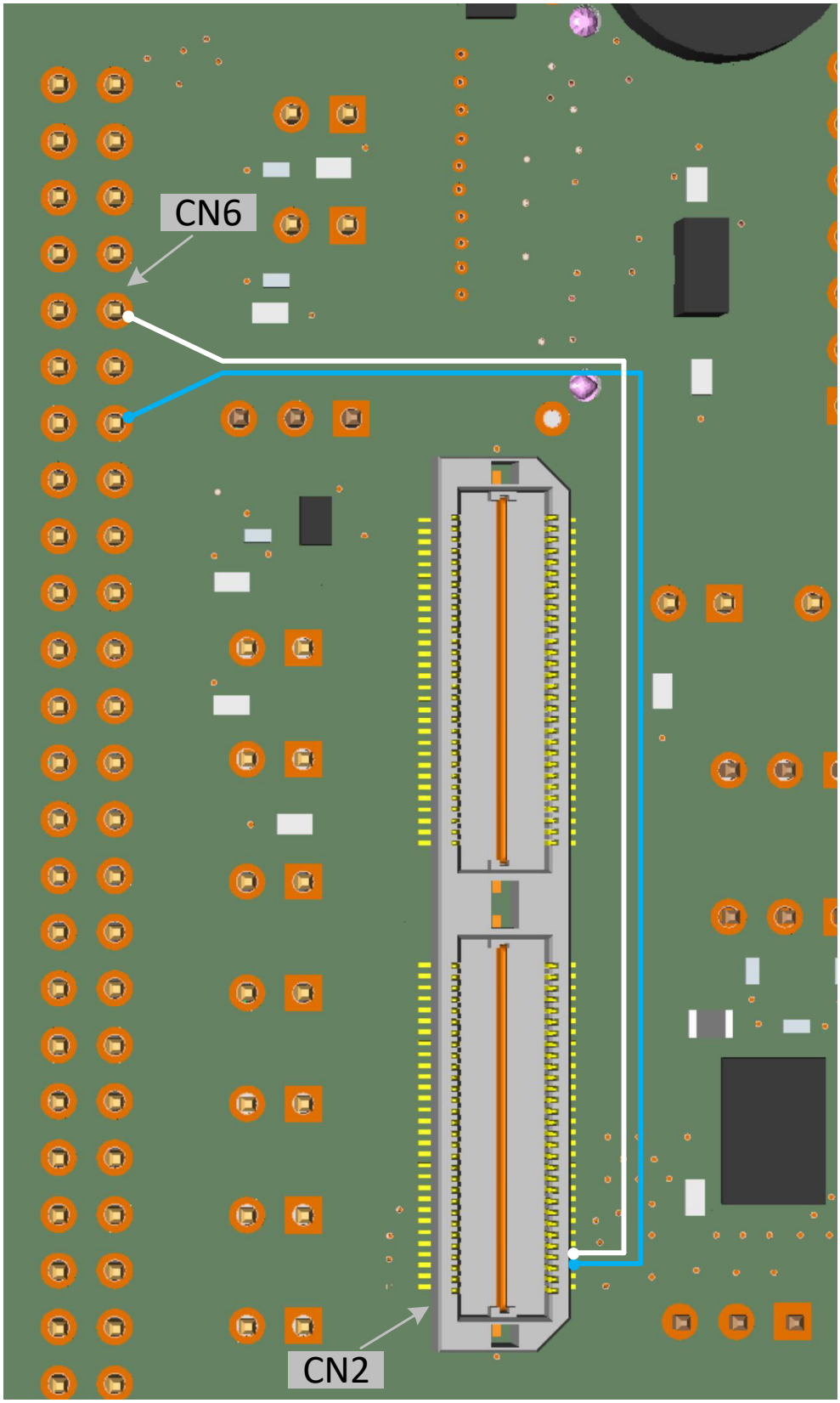


Figure 7 Recommended Connection for CAN5

Chapter 10 Mechanical dimensions

All dimensions given in mm.

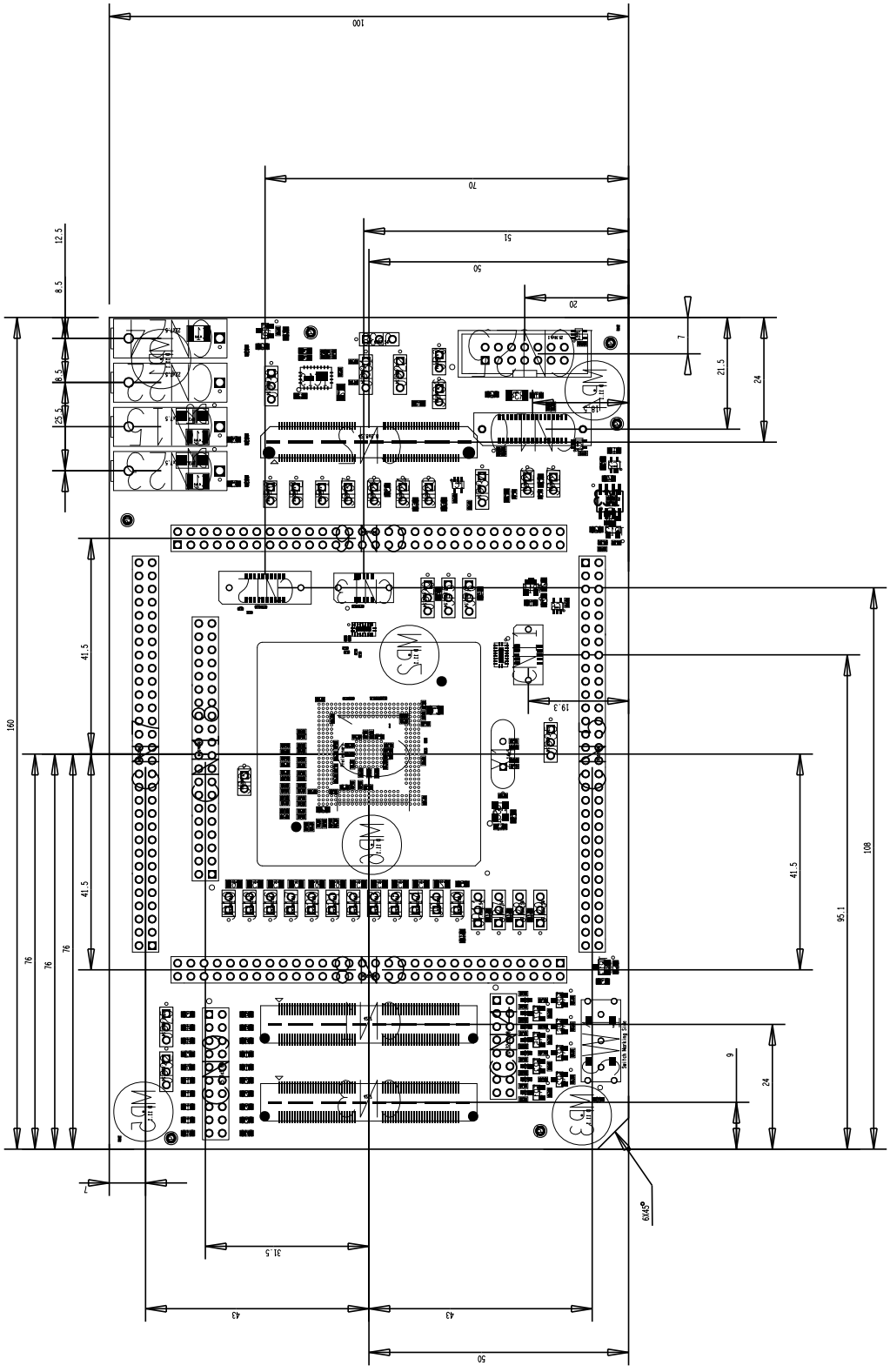


Figure 8 Dimensions of the PiggyBack Board

Chapter 11 Schematic

CAUTION: *The schematics shown in this document are not intended to be used as a reference for mass production. Any usage in an application design is in sole responsibility of the customer.*

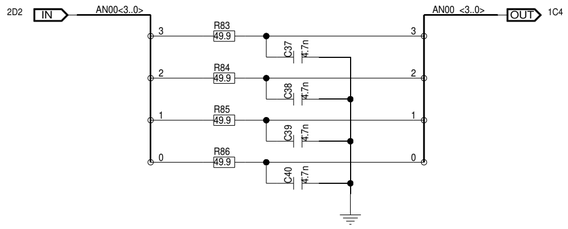
The following components described in the schematic are not provided with the board:

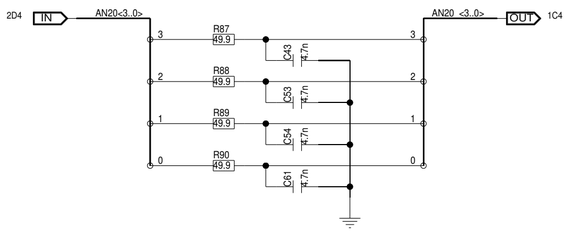
- Oscillator OSC1
- Capacitors C29 and C33
- Resistances
    - R48 and R49
    - R79 and R101
    - R31, R50, R75, R76, R78, R108 – R113, R115, R116, R118 and R119

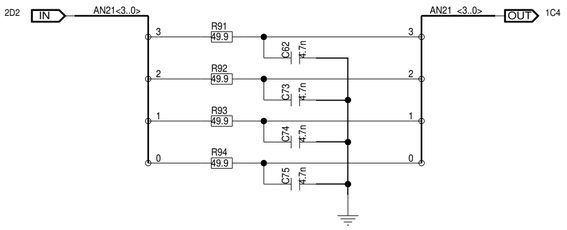
The following components described in the schematic are provided with but not mounted on the board:

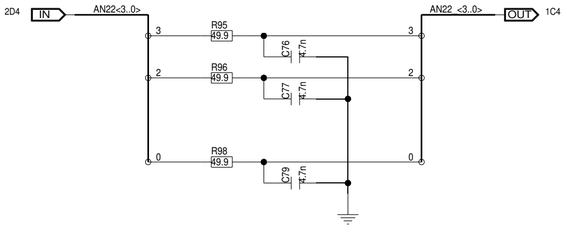
- Standard 4mm power lab sockets
    - CN22
    - CN15, CN23 and CN24

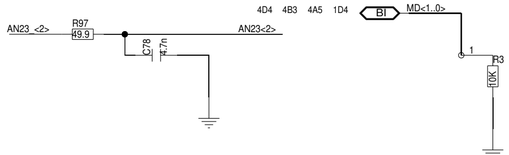
Version	Changes	Date	Name
1.00	Release	07.02.2018	W.Rauser

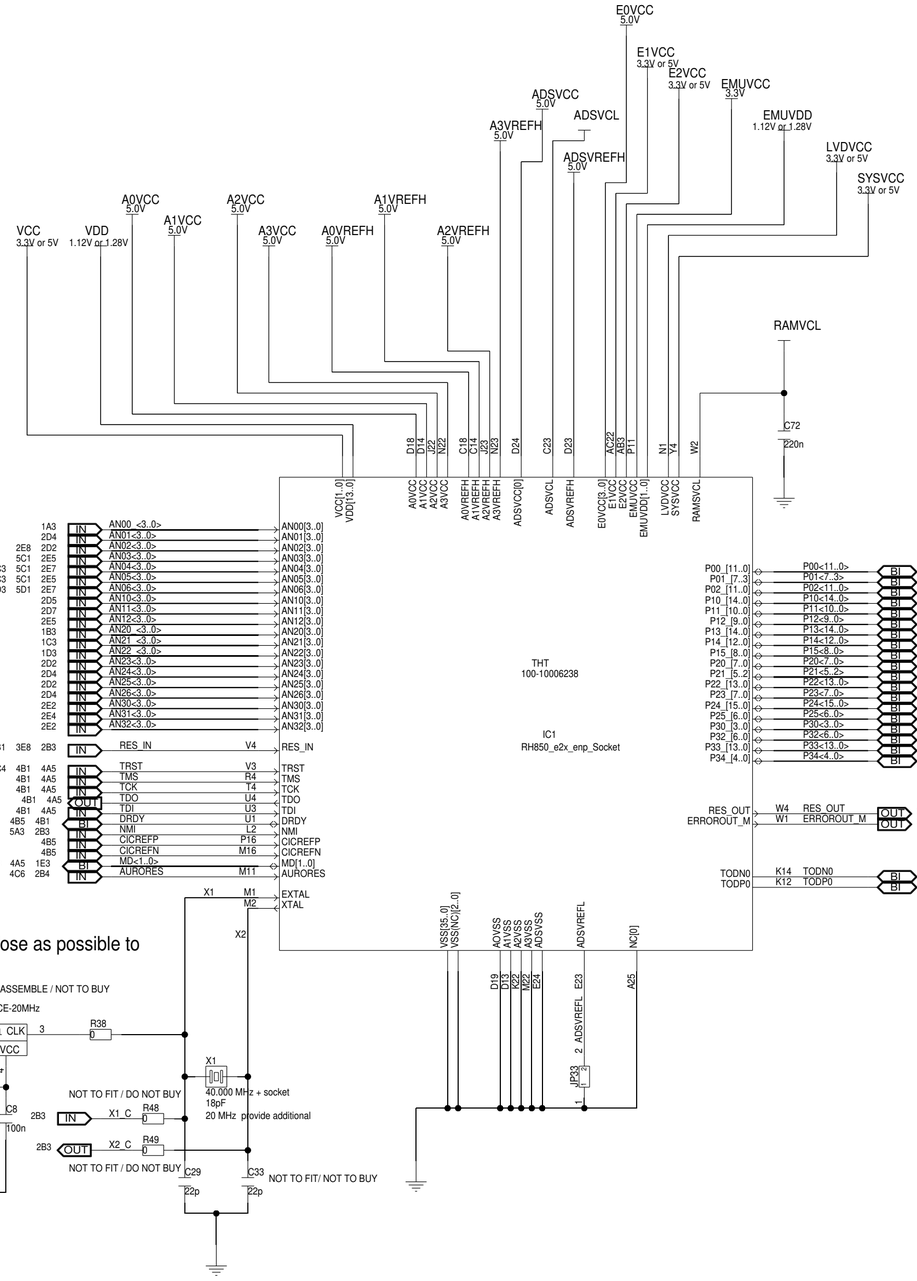


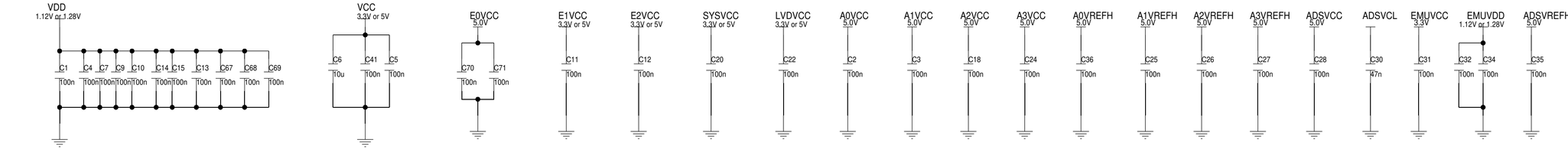












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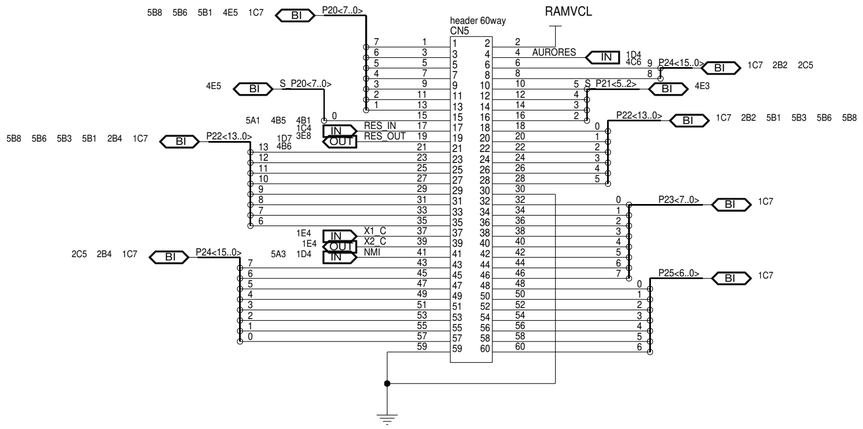

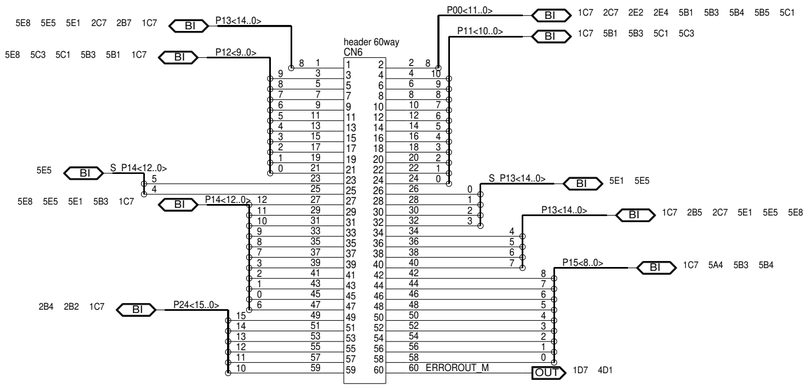

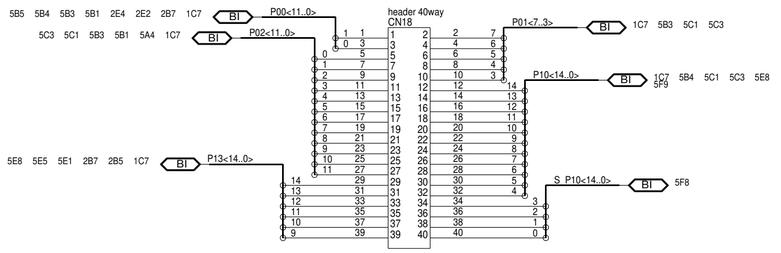

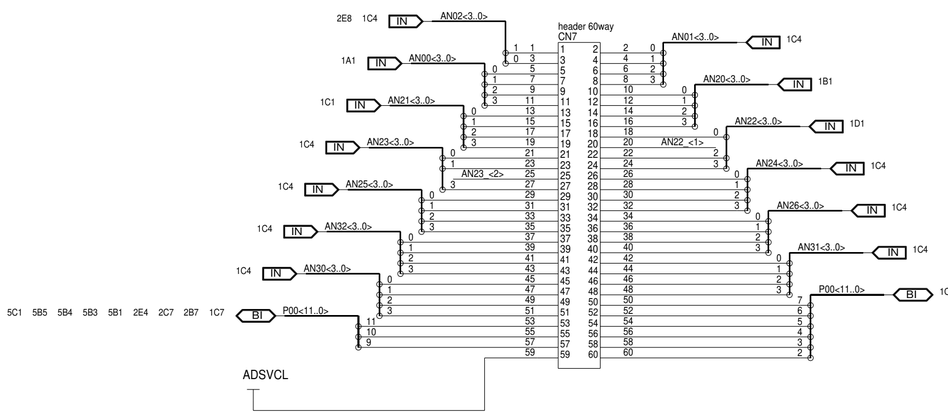

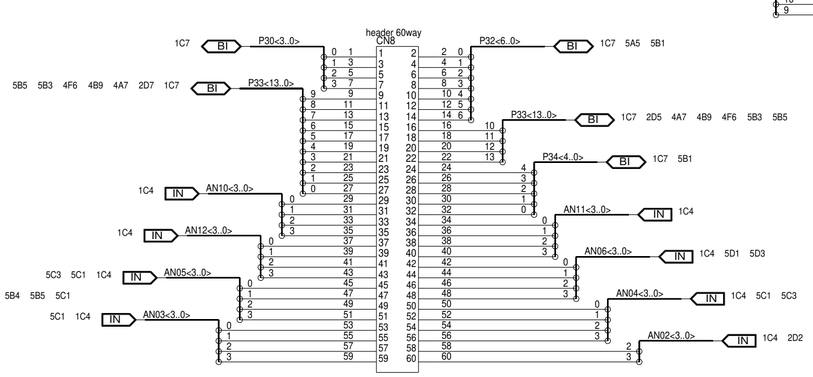

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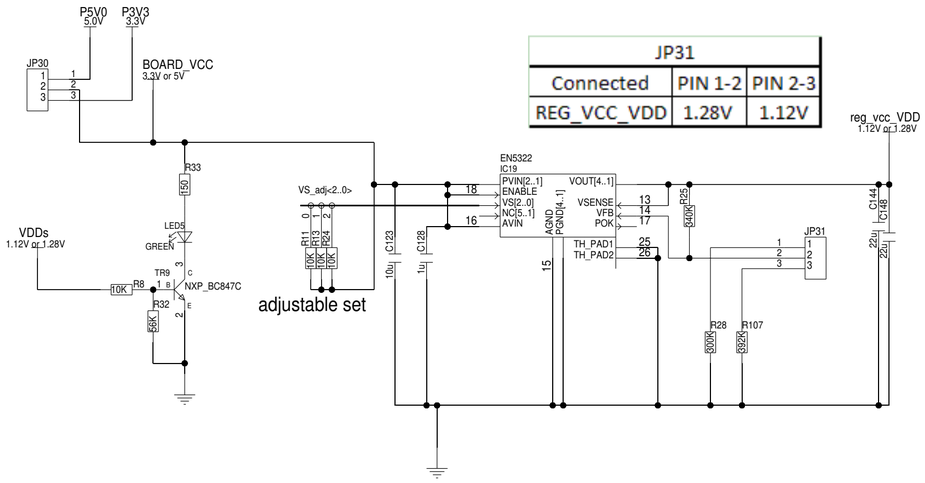
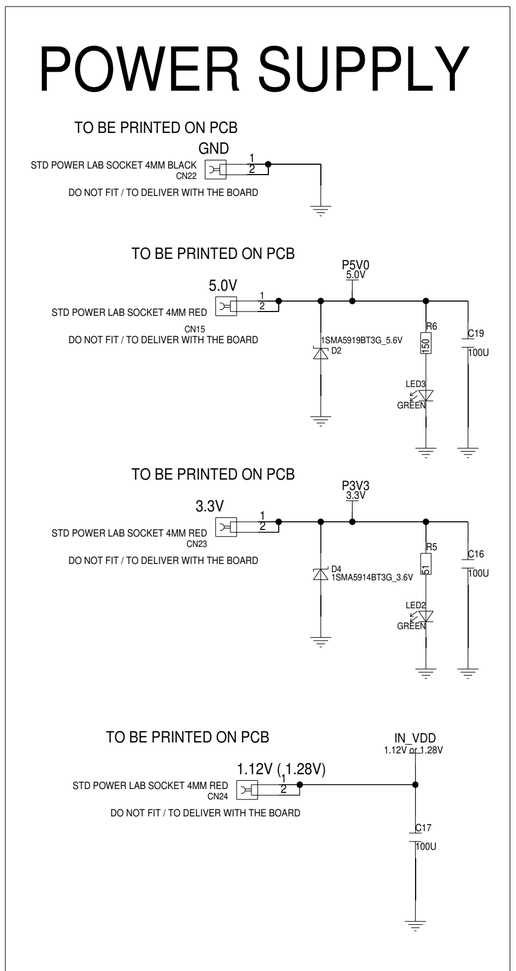
VOLTAGE REGULATOR

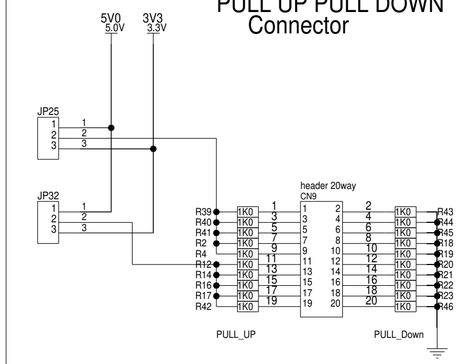


JP31		
Connected	PIN 1-2	PIN 2-3
REG_VCC_VDD	1.28V	1.12V

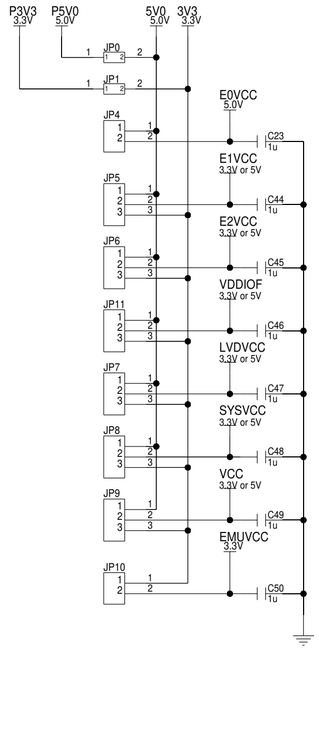
POWER SUPPLY

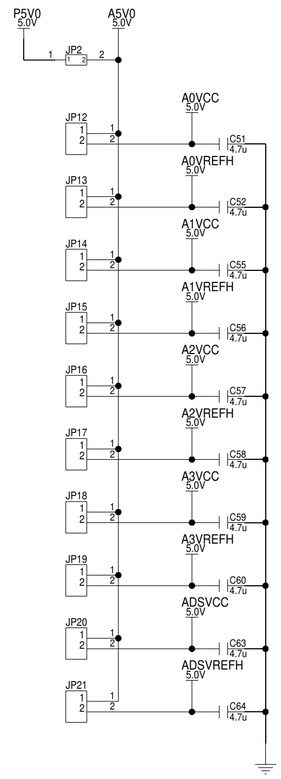


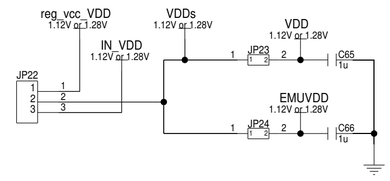
PULL UP PULL DOWN Connector



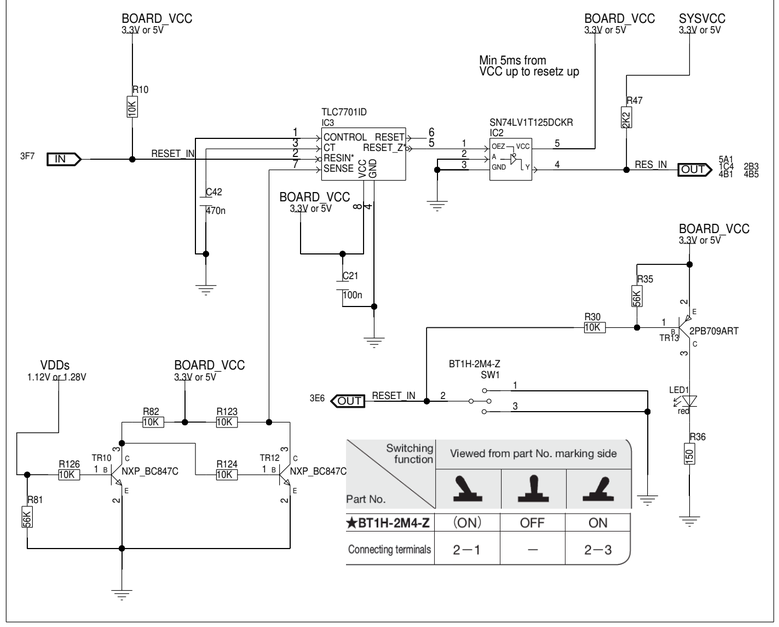
VOLTAGE DISTRIBUTION







SWITCH FOR RESET



Switching function / Part No.	Viewed from part No. marking side		
★BT1H-2M4-Z	(ON)	OFF	ON
Connecting terminals	2—1	—	2—3

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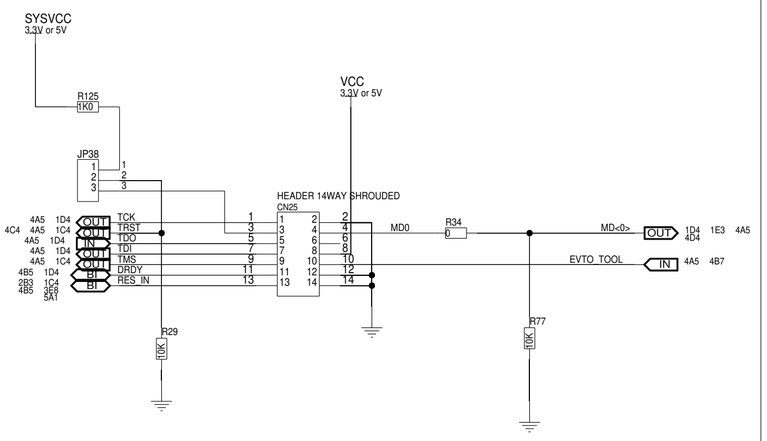
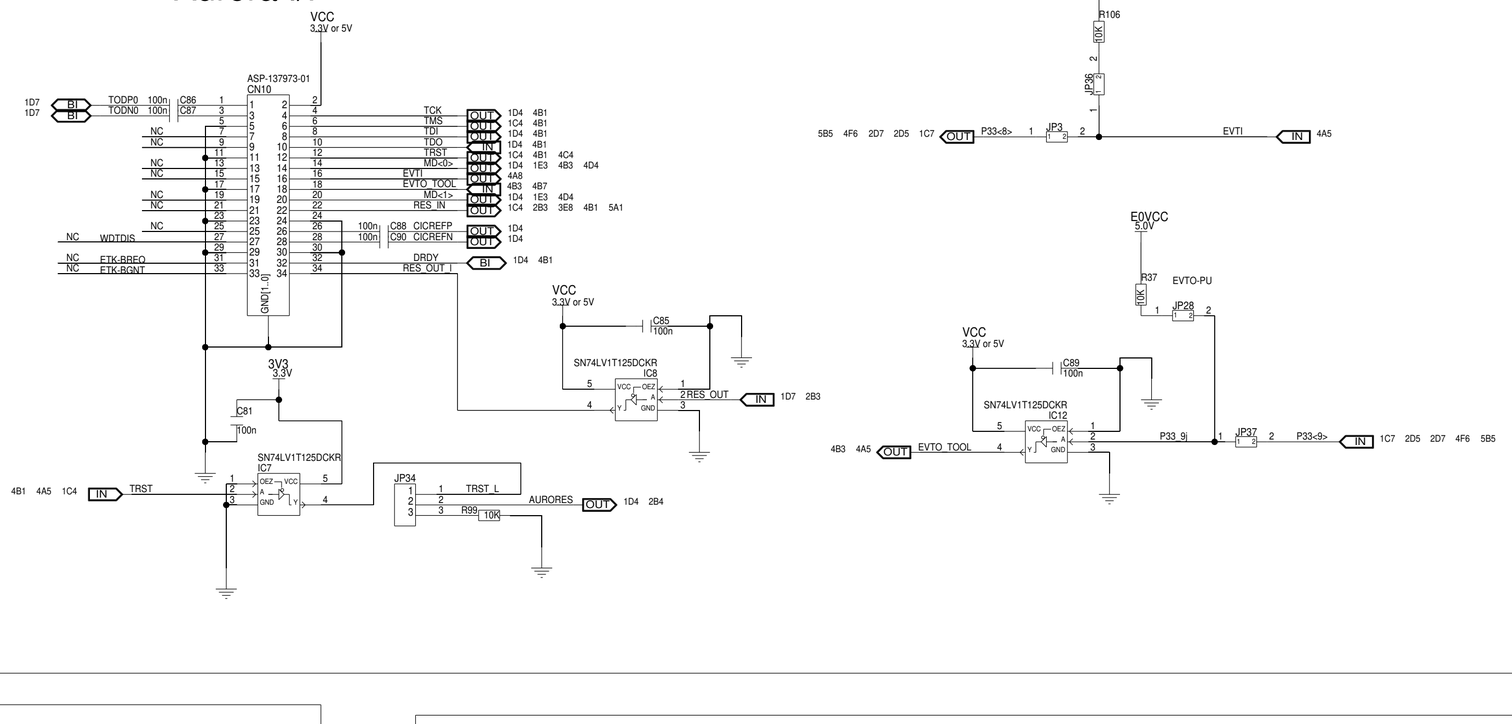
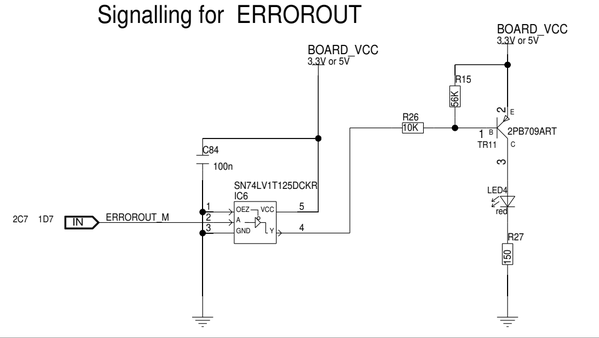
DEBUG AND PROGRAMMING INTERFACE



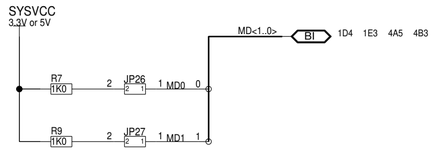
Aurora I/F



Signalling for ERROROUT



MODE Jumper



RHSIF I/F

LED - P33<7..0>

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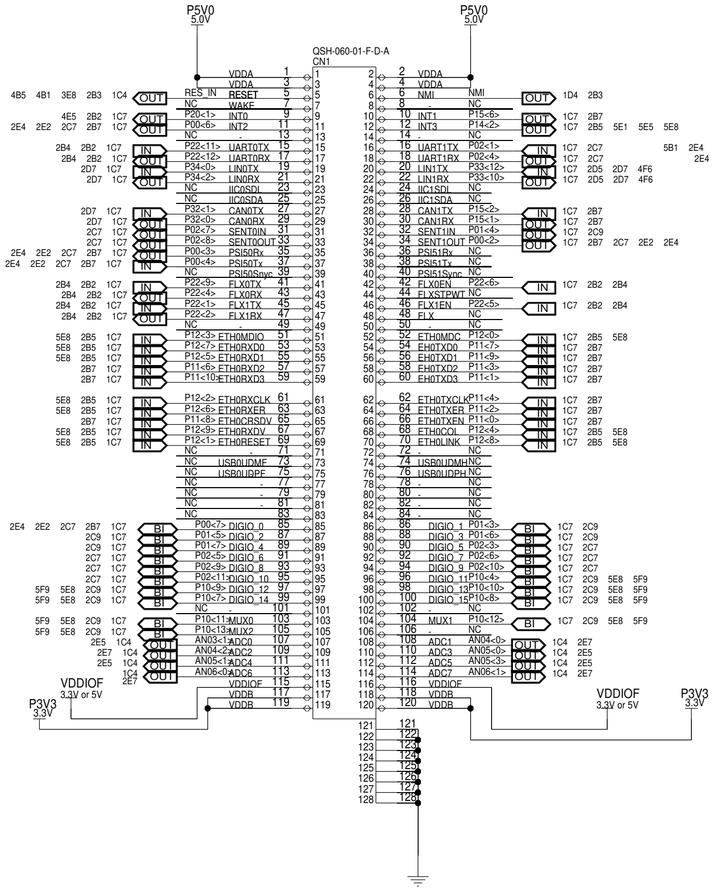
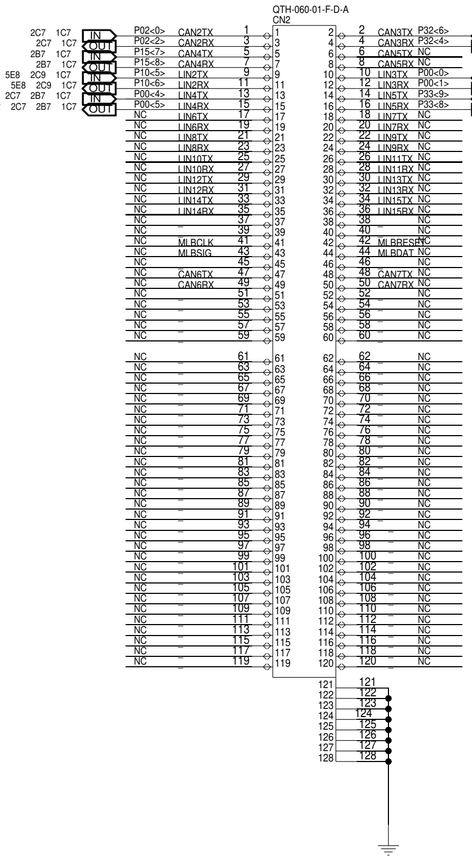
CONNECT TO MAIN BOARD

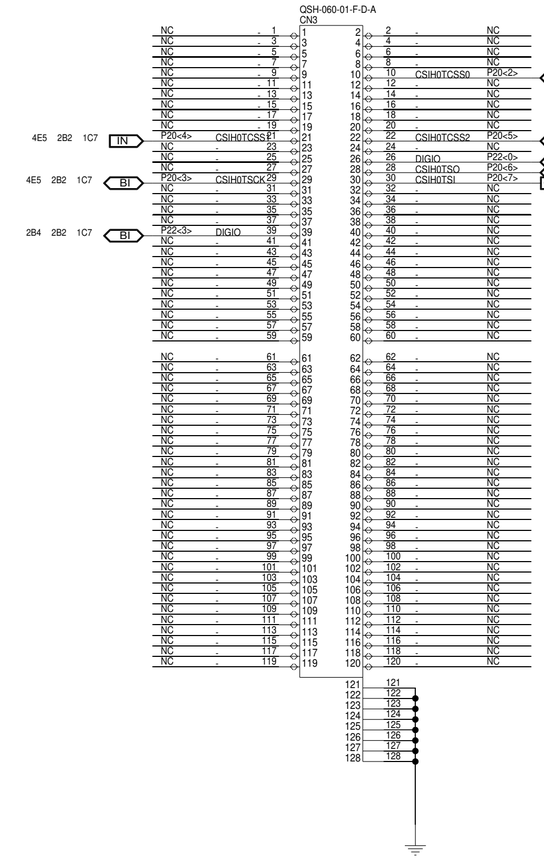
CONNECTOR1



CONNECTOR2



CONNECTOR3



FUDUCIALS

TOP

TP11 FIDUCIAL_1MM
TP12 FIDUCIAL_1MM

BOTTOM

TP14 FIDUCIAL_1MM
TP15 FIDUCIAL_1MM

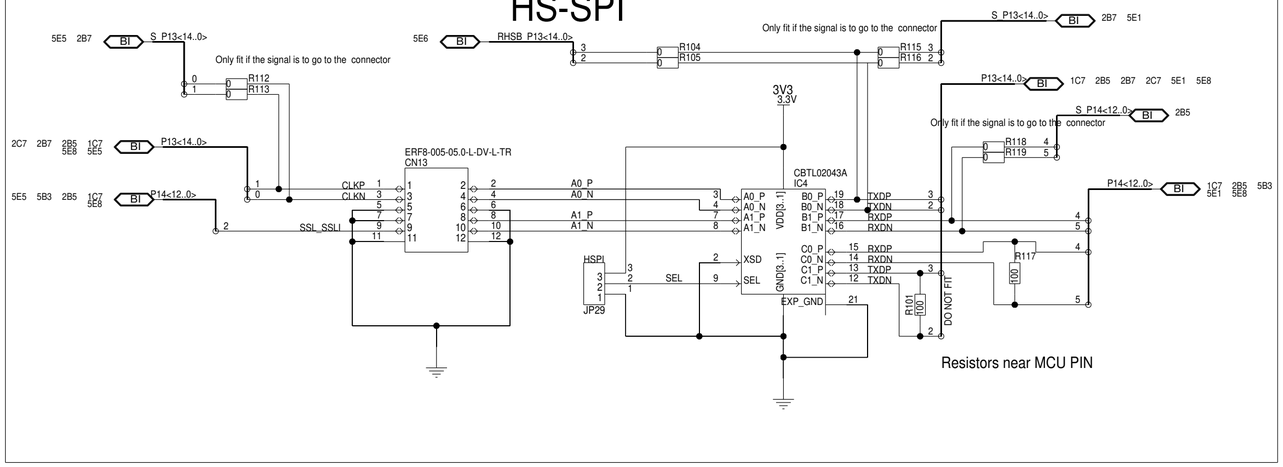
GND TEST POINT

TP5 GND-TESTPOINT
TP6 GND-TESTPOINT
TP7 GND-TESTPOINT
TP8 GND-TESTPOINT
TP9 GND-TESTPOINT
TP10 GND-TESTPOINT

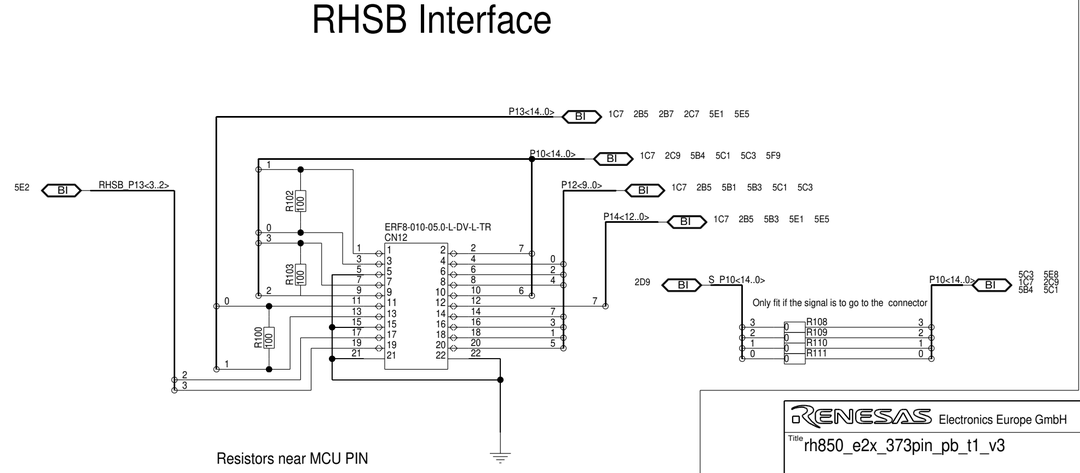
RUBBER FEET

BLACK MP1
BLACK MP2
BLACK MP3
BLACK MP4
BLACK MP5
BLACK MP6

HS-SPI



RHSB Interface



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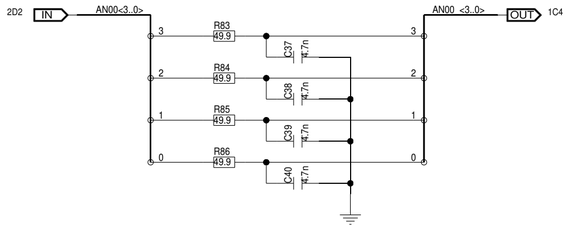
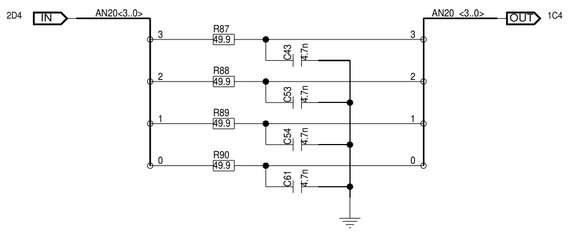
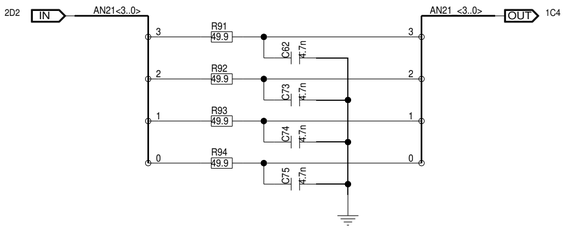
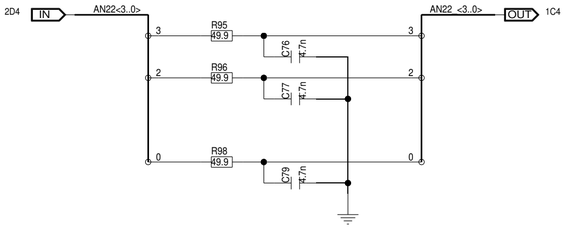
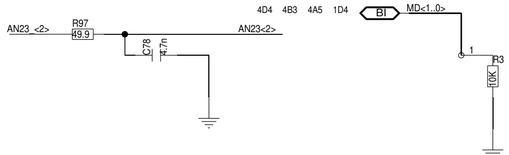
1.00	Release	07.02.2018	W.Rauser

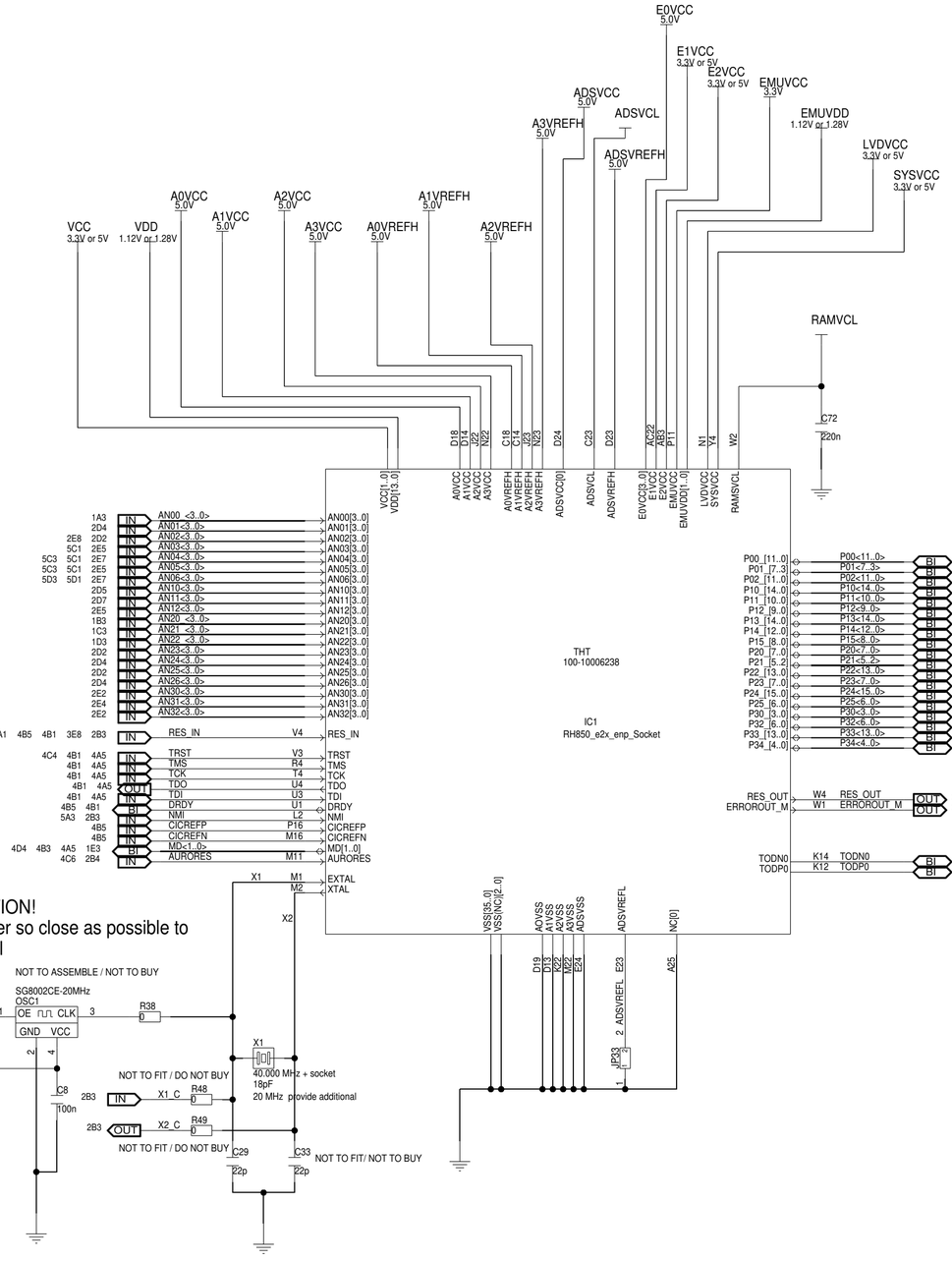


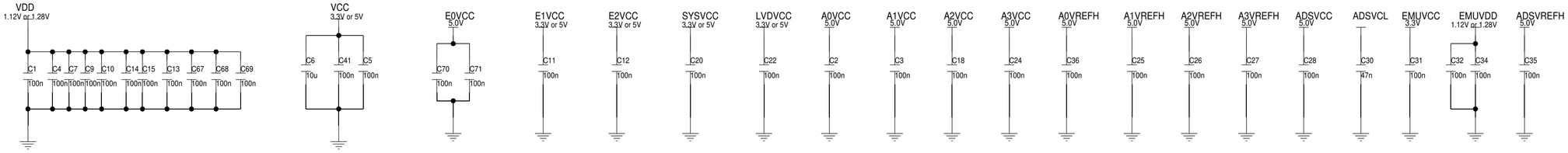












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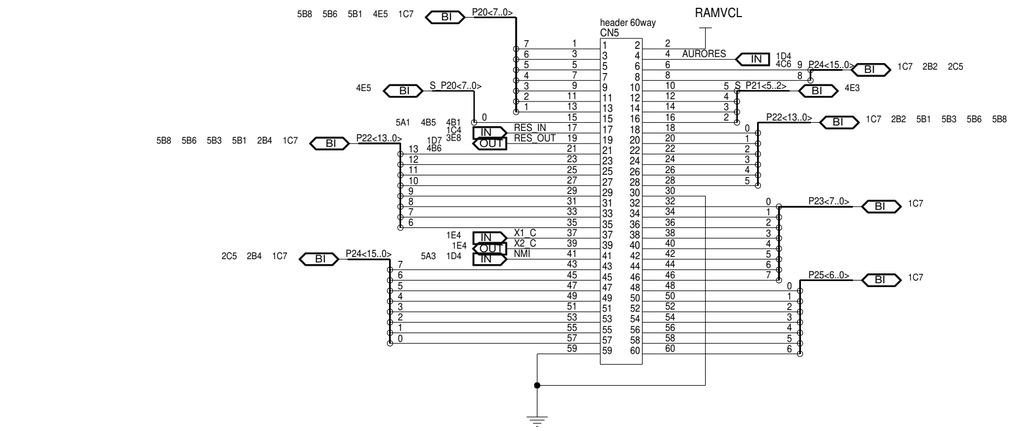

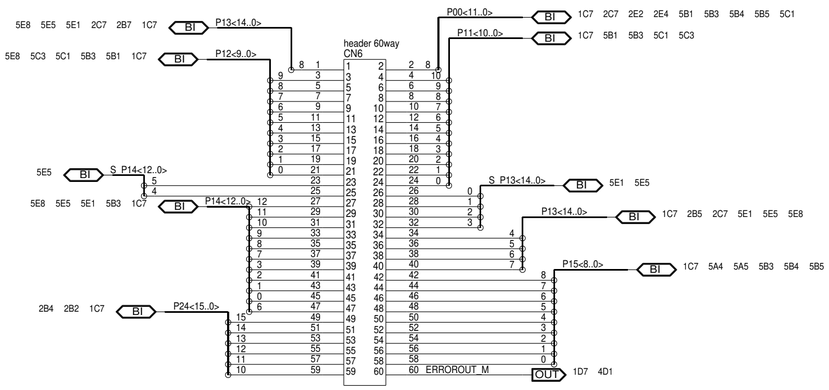

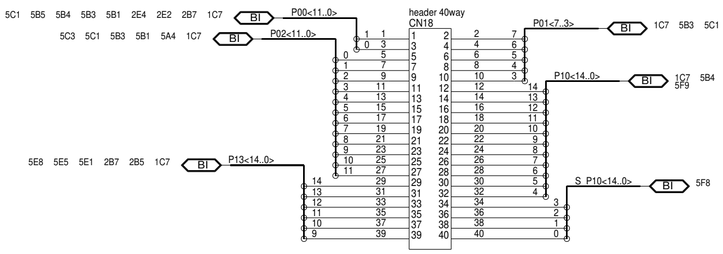

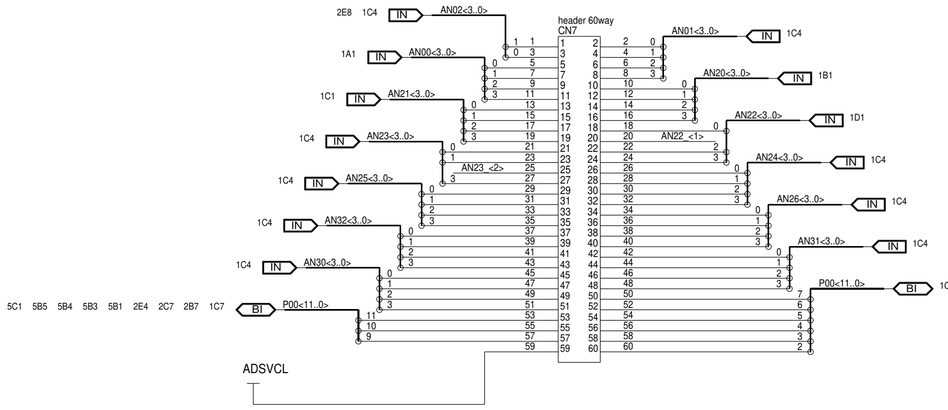

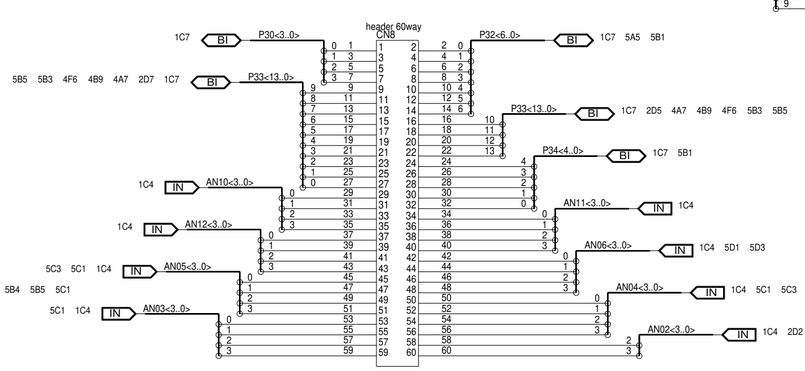

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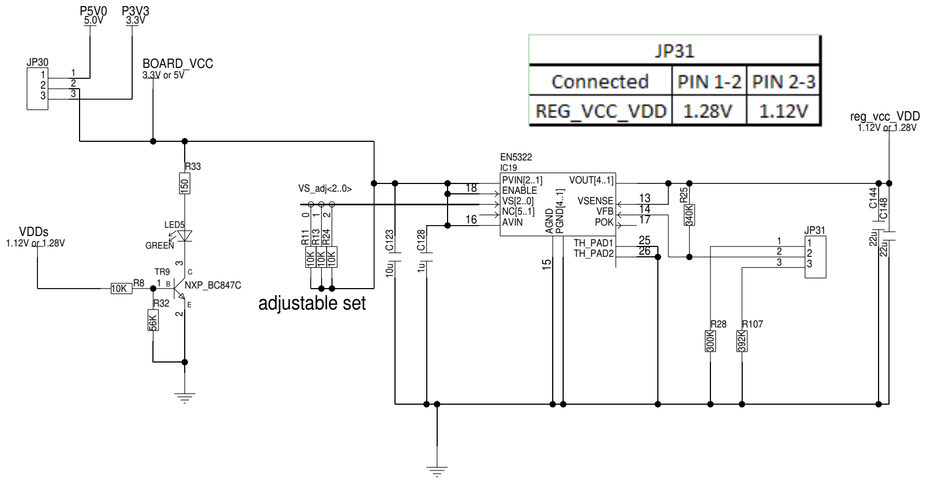
VOLTAGE REGULATOR

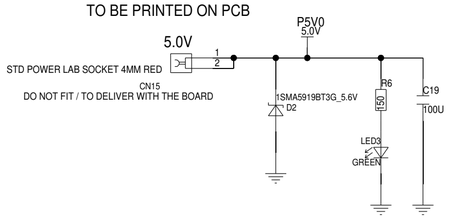


JP31		
Connected	PIN 1-2	PIN 2-3
REG_VCC_VDD	1.28V	1.12V

POWER SUPPLY

TO BE PRINTED ON PCB

TO BE PRINTED ON PCB



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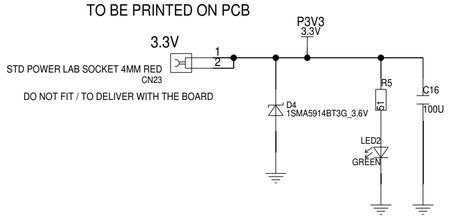
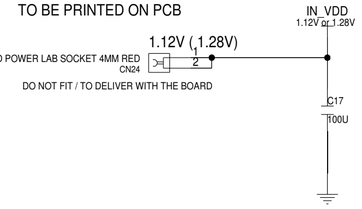
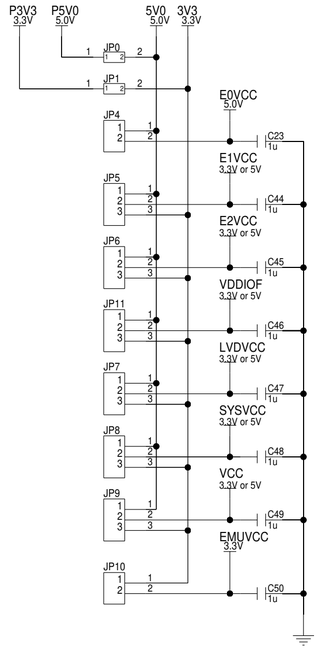


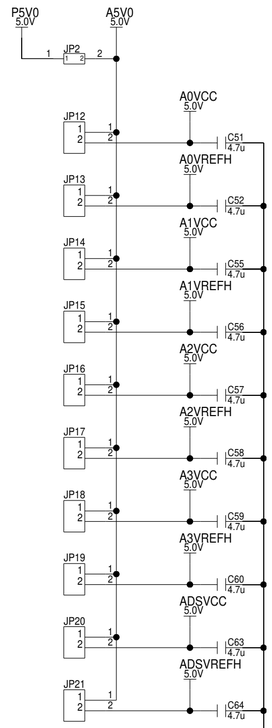
TO BE PRINTED ON PCB

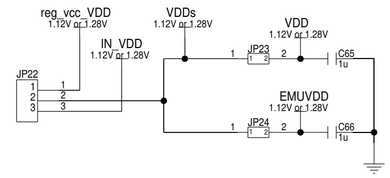


PULL UP PULL DOWN
Connector

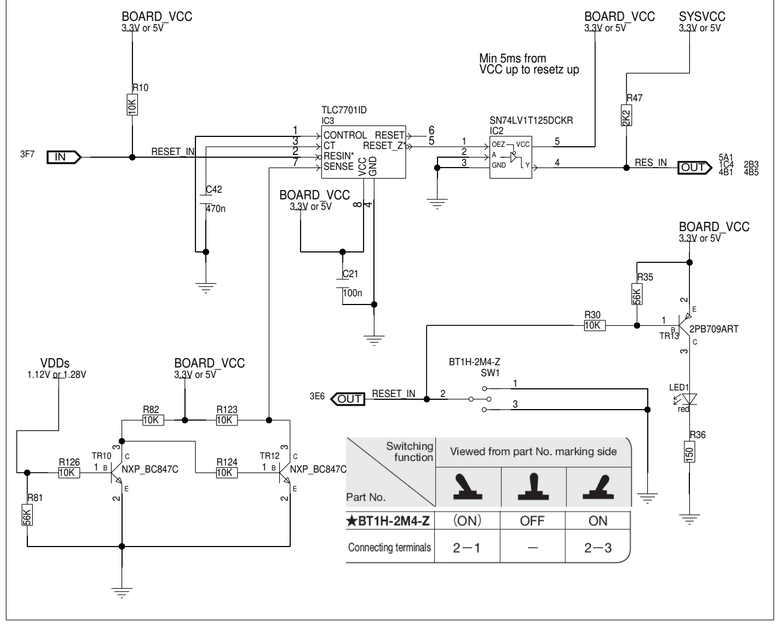
VOLTAGE DISTRIBUTION







SWITCH FOR RESET



Switching function	Viewed from part No. marking side		
Part No.			
★BT1H-2M4-Z	(ON)	OFF	ON
Connecting terminals	2—1	—	2—3

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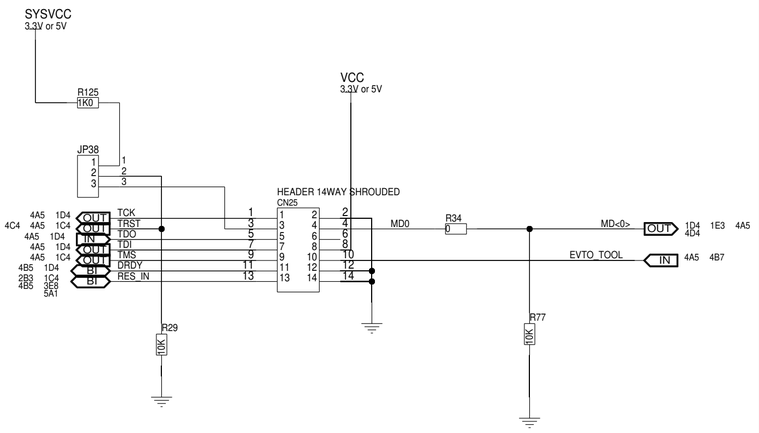
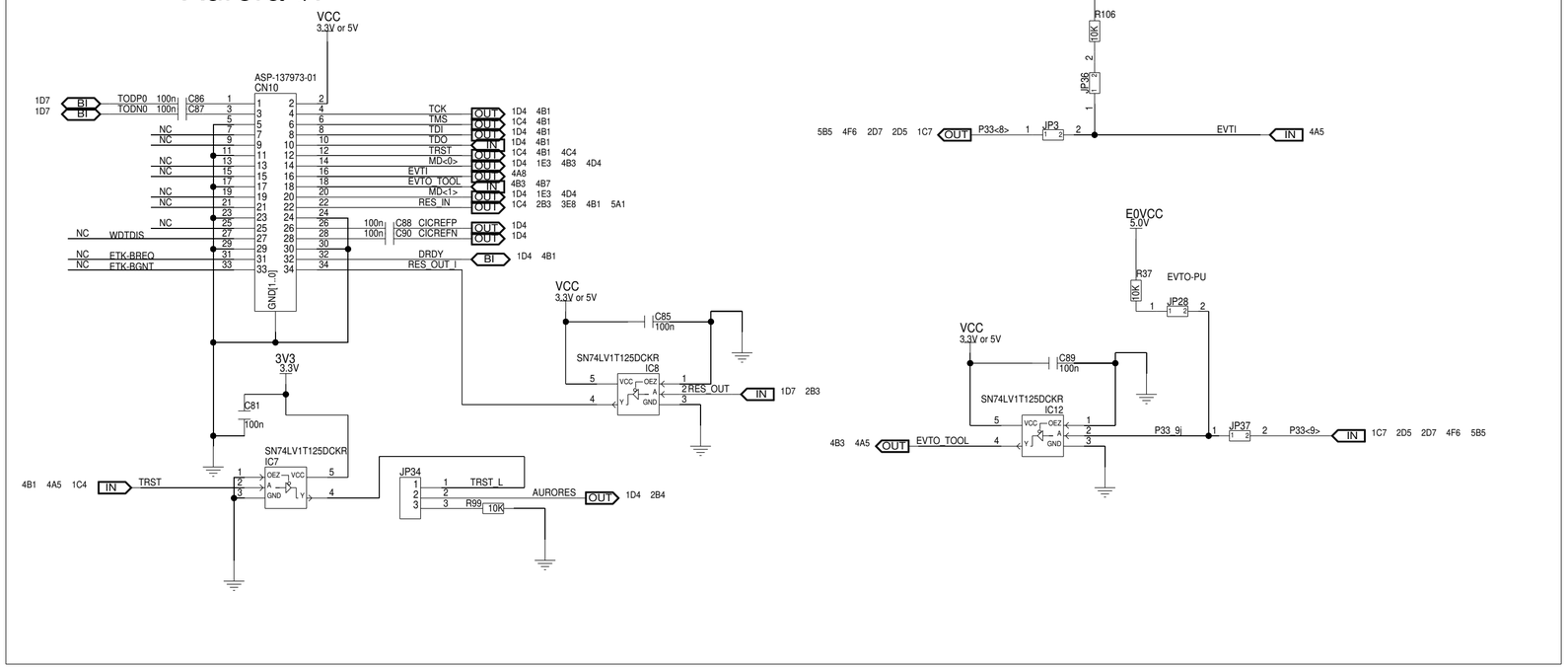
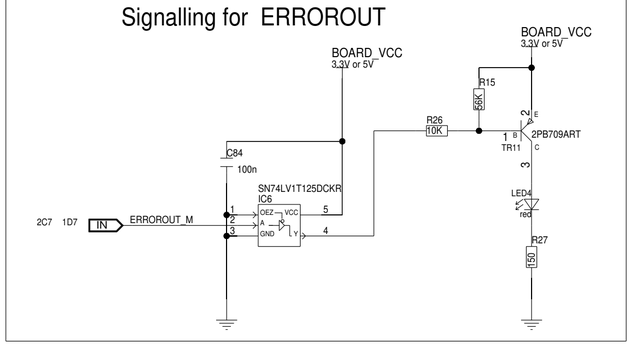
DEBUG AND PROGRAMMING INTERFACE



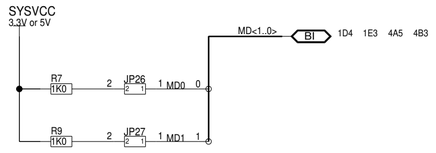
Aurora I/F



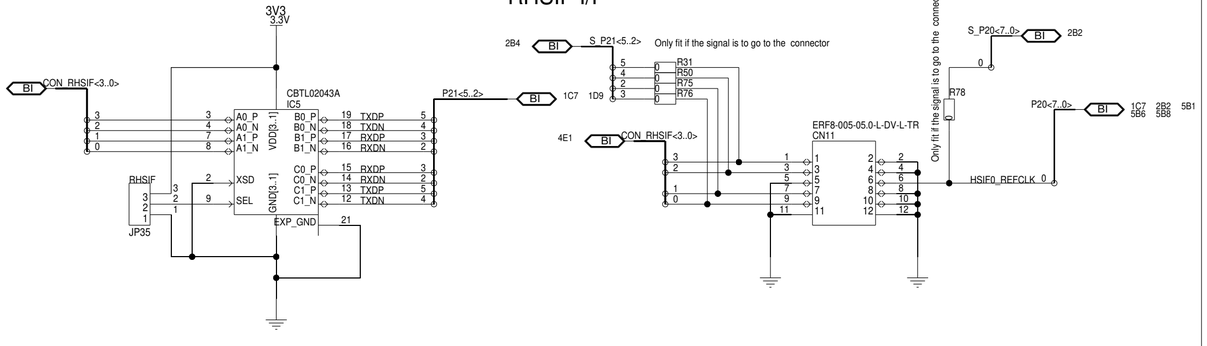
Signalling for ERROROUT



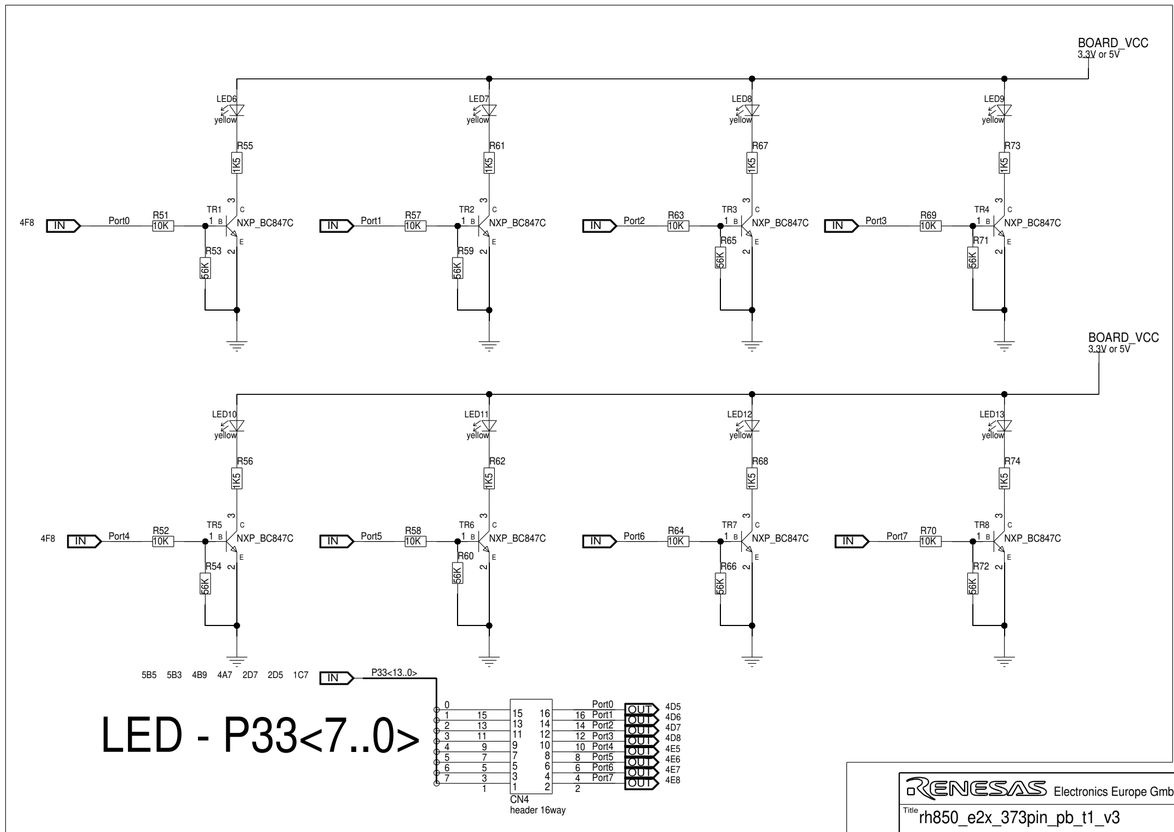
MODE Jumper



RHSIF I/F



LED - P33<7..0>



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Size	A2
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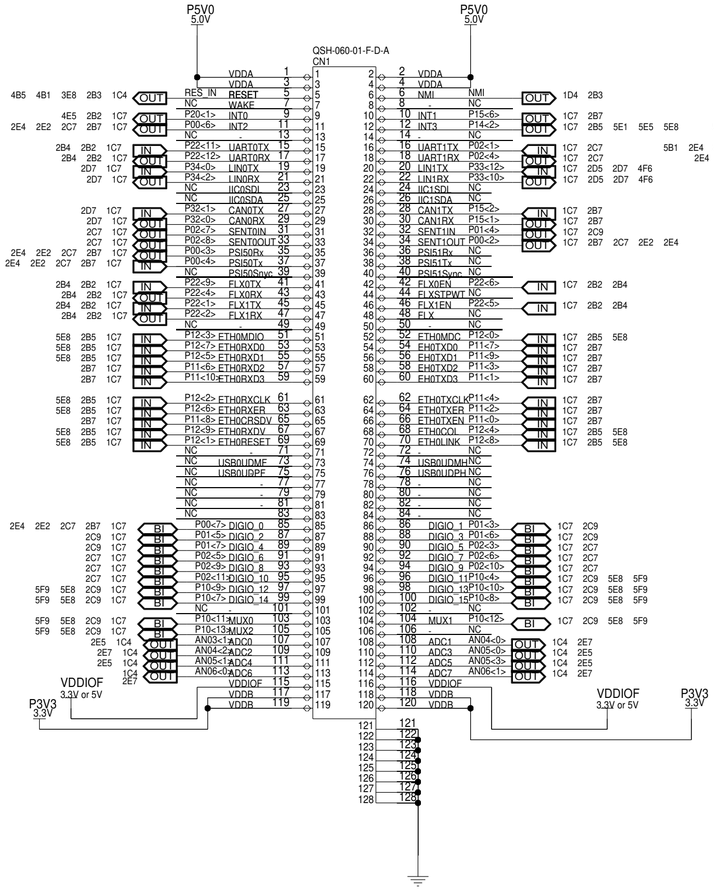
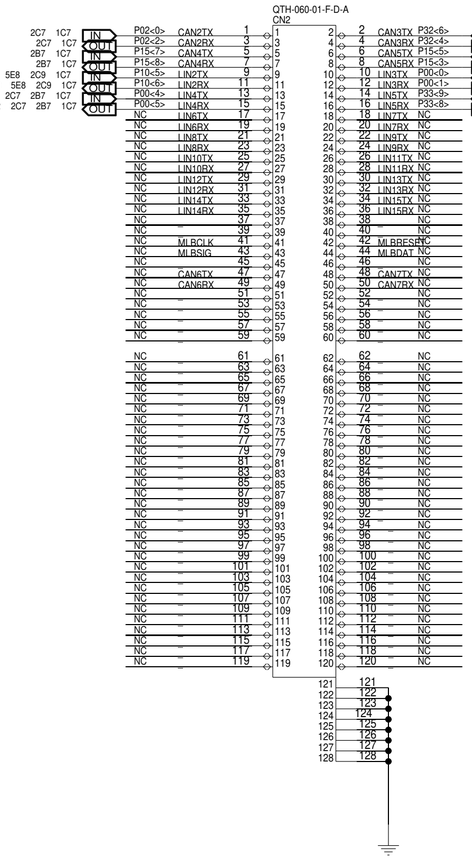
CONNECT TO MAIN BOARD

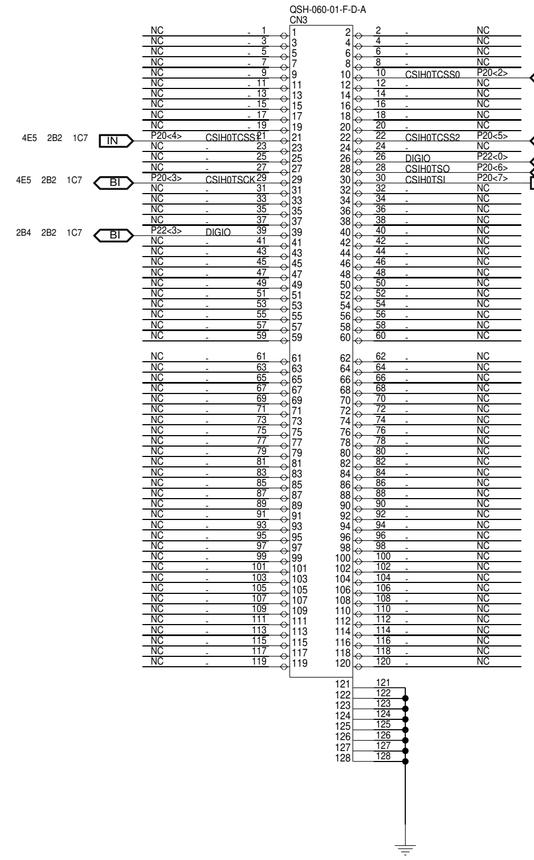
CONNECTOR1



CONNECTOR2



CONNECTOR3



FUDUCIALS

TOP

TP11 FIDUCIAL_1MM

TP12 FIDUCIAL_1MM

BOTTOM

TP14 FIDUCIAL_1MM

TP15 FIDUCIAL_1MM

GND TEST POINT

TP5 GND-TESTPOINT

TP6 GND-TESTPOINT

TP7 GND-TESTPOINT

TP8 GND-TESTPOINT

TP9 GND-TESTPOINT

TP10 GND-TESTPOINT

RUBBER FEET

BLACK MP1

BLACK MP2

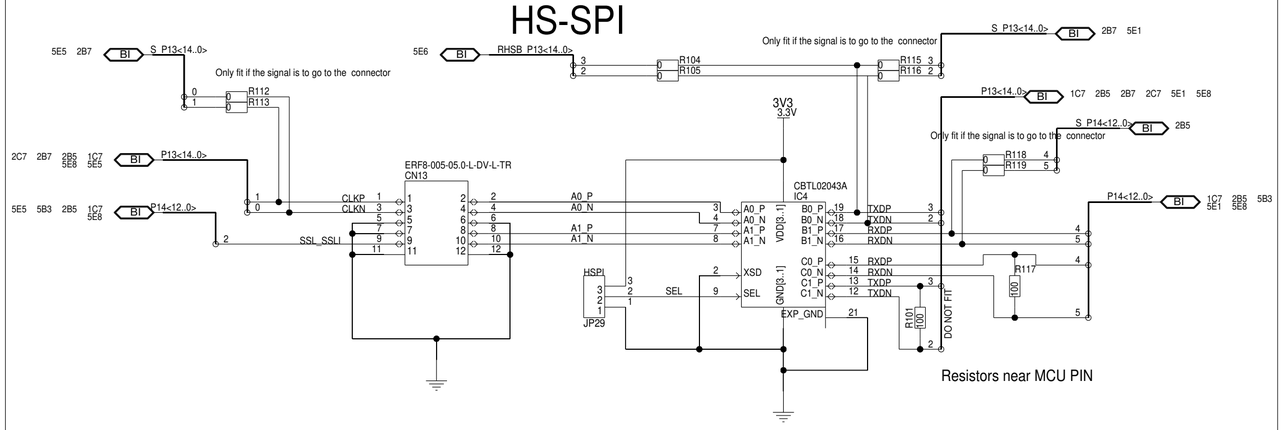
BLACK MP3

BLACK MP4

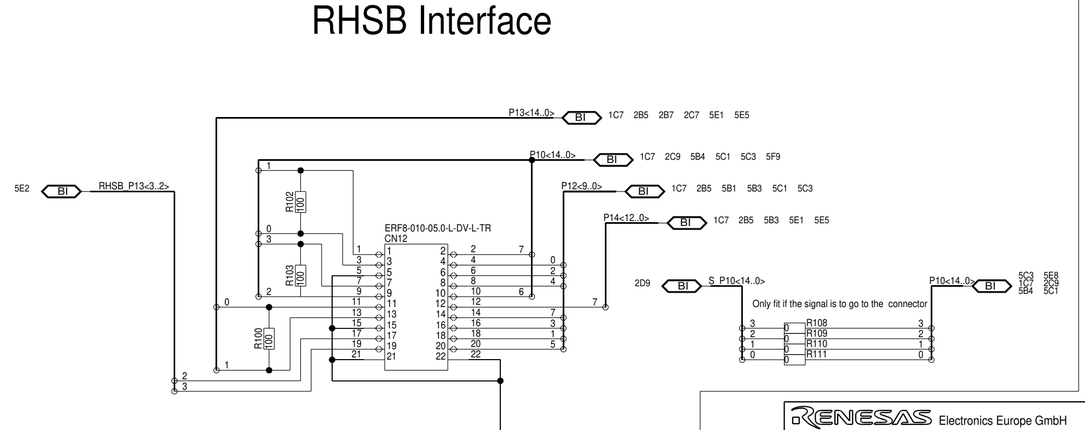
BLACK MP5

BLACK MP6

HS-SPI



RHSB Interface



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Title	rh850_e2x_373pin_pb_t1_v3		
Size	Document Number		
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Chapter 12 Revision History

The table provides information about the major changes of the document versions.

Date	Version	Description
2018-05-17	1.0	Initial release
2018-08-03	1.1	Changes: • Chapter 2.2: Removed unsupported device. • Chapter 3.2: Correction and replacement of Figure 4.

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