

RH850 Evaluation Platform

# RH850/F1x 100-pin RH850/R1x 100-pin Piggyback board V3

## Y-RH850-F1X-100PIN-PB-T1-V3

All information contained in these materials, including products and product specifications, represents information on the product at the time of publication and is subject to change by Renesas Electronics Corp. without notice. Please review the latest information published by Renesas Electronics Corp. through various means, including the Renesas Technology Corp. website (<http://www.renesas.com>).

The newest version of this document can be obtained from the following web location  
<http://www.renesas.eu/updates?oc=Y-RH850-F1X-100PIN-PB-T1-V3>

### Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment;

Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.

6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.

Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

## General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. **Handling of Unused Pins**  
Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.
  - The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.
2. **Processing at Power-on**  
The state of the product is undefined at the moment when power is supplied.
  - The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.  
In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.
3. **Prohibition of Access to Reserved Addresses**  
Access to reserved addresses is prohibited.
  - The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.
4. **Clock Signals**  
After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.
  - When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.
5. **Differences between Products**  
Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.
  - The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

## Table of Contents

<b>Chapter 1</b>	<b>Introduction .....</b>	<b>5</b>
<b>Chapter 2</b>	<b>Overview .....</b>	<b>6</b>
2.1	Overview .....	6
2.2	Mounting of the device .....	7
<b>Chapter 3</b>	<b>Jumper Configuration .....</b>	<b>8</b>
<b>Chapter 4</b>	<b>Power supply .....</b>	<b>10</b>
4.1	Board power connection .....	10
4.2	Voltage distribution .....	11
<b>Chapter 5</b>	<b>Clock sources .....</b>	<b>12</b>
5.1.1	MainOsc .....	12
<b>Chapter 6</b>	<b>Debug and Programming interface .....</b>	<b>13</b>
<b>Chapter 7</b>	<b>Connectors for ports of device.....</b>	<b>14</b>
7.1	Connectors to MainBoard.....	14
7.1.1	Connector CN1 (RH850-F1X-100PIN-PB-T1-V3).....	14
7.1.2	Connector CN2 (RH850-F1X-100PIN-PB-T1-V3).....	16
7.1.3	Connector CN3 (RH850-F1X-100PIN-PB-T1-V3).....	17
<b>Chapter 8</b>	<b>Other circuitry.....</b>	<b>19</b>
8.1	Push button for RESET .....	19
8.2	Mode Selection .....	19
8.3	Signalling LEDs .....	19
<b>Chapter 9</b>	<b>Precautions.....</b>	<b>20</b>
9.1	Usage of LIN15.....	20
9.1.1	Adjustments on RH850/X1x Network Main Board .....	20
9.1.2	Adjustments on RH850/X2x Main Board .....	21
<b>Chapter 10</b>	<b>Mechanical dimensions .....</b>	<b>22</b>
<b>Chapter 11</b>	<b>Schematic .....</b>	<b>23</b>
<b>Chapter 12</b>	<b>Revision History .....</b>	<b>26</b>

## Chapter 1 Introduction

The RH850/F1x 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/F1x microcontrollers. The piggyback board (Y-RH850-F1X-100PIN-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. 3.3V-5.0V)
- Device programming capability
- Device debugging capability
- Pin headers for direct access to each device pin
- Reset switch
- MainOSC circuitry
- Signal LEDs
- Jumpers for device mode selection
- Connectors to MainBoard

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 related User's Manual and Datasheet.

This manual describes the following board revisions:

- RH850-F1X-100PIN-PB-T1-V3

For differences to the RH850-F1X-100PIN-PB-T1-V2 see the Revision History.

# Chapter 2 Overview

## 2.1 Overview

Figures 1 and 2 provide the views of the RH850-F1X-100PIN-PB-T1-V3 Piggyback Board.

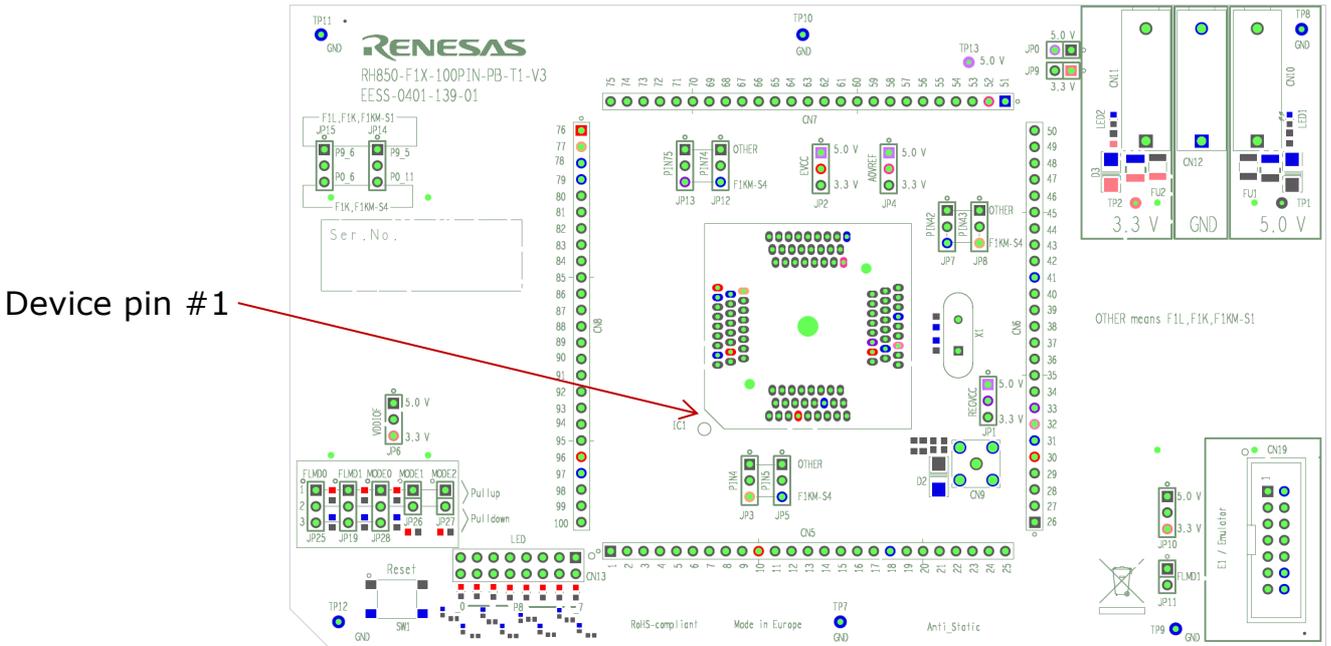


Figure 3 – RH850-F1X-100PIN-PB-T1-V3 top view

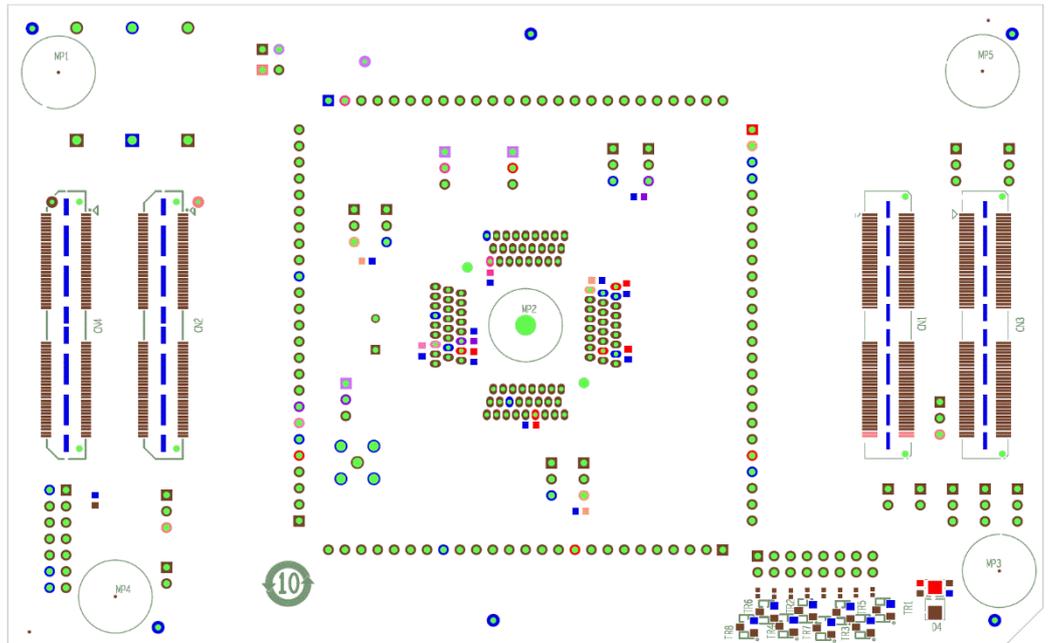


Figure 4 – RH850-F1X-100PIN-PB-T1-V3 bottom view

## 2.2 Mounting of the device

The board is designed for use with the following devices, all in 100pin package:

- RH850/F1L
- RH850/R1L
- RH850/F1K
- RH850/F1KM-S1
- RH850/F1KM-S4

The device must be placed inside the socket IC1. To insert the device, press down the lid, align the #1 pin of the device to the #1pin of the socket, insert the device inside the socket and release the lid.

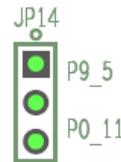
## Chapter 3 Jumper Configuration

The function of the board can be configured via jumpers. This chapter describes the standard configuration, i.e. jumper setting for the intended devices. For the supported function of the used device, please refer to the corresponding HW user's manual.

The table has the following meaning:

- x-y: Connect the pins x and y; valid for 3-pin jumpers (e.g. JP14)

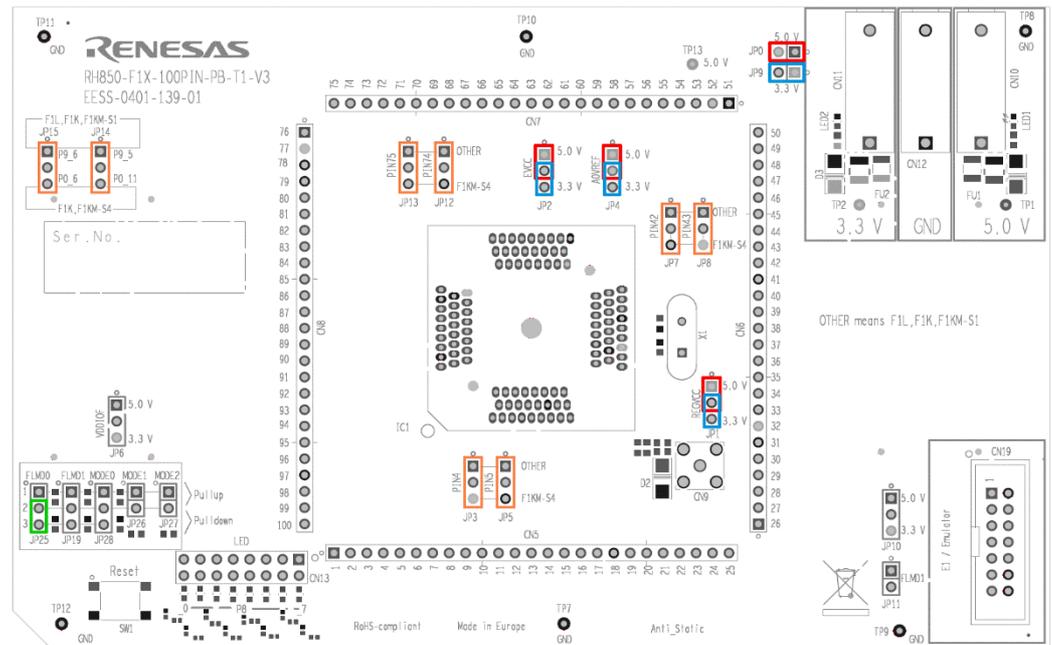
The pin #1 can be identified by a small circle in the vicinity of the jumper.



Depending on the used device a configuration of several jumpers is required. The detailed configuration is shown below:

Jumper	F1L	R1L	F1K	F1KM-S1	F1KM-S4	Function
JP3	1-2	1-2	1-2	1-2	2-3	Selection pin pin #4: Either P10_15 or ISOVCL
JP5	1-2	1-2	1-2	1-2	2-3	Selection pin pin #5: Either P11_0 or VSS
JP7	1-2	1-2	1-2	1-2	2-3	Selection pin pin #42: Either P8_0 or VSS
JP8	1-2	1-2	1-2	1-2	2-3	Selection pin pin #43: Either P8_1 or ISOVCL
JP12	1-2	1-2	1-2	1-2	2-3	Selection pin pin #74: Either P9_5 or VSS
JP13	1-2	1-2	1-2	1-2	2-3	Selection pin pin #75: Either P9_6 or REGVCC
JP14 1-2	Close	-	Either - or	-	-	Selection of PWM34 Either from P9_5 or P0_11
JP14 2-3	-	-		Close	Close	
JP15 1-2	Close	-	Either - or	-	-	Selection of PWM35 Either from P9_6 or P0_6
JP15 2-3	-	-		Close	Close	

The jumper settings also are shown in the picture on the next page.



- The **green** jumper JP25 for FLMDO0 always must be closed (at the position 2-3) for a 'normal' (user mode and debug) operation of the device.
- The **red** jumpers must be set for a single "Voltage 1" (typ +5.0V) operation of the device.
- The **blue** jumper must be set for a single "Voltage 2" (typ +3.3V) operation of the device.
- The **orange** jumpers must be selected depending on the used device. See the printing on the board for the applicable setting.

**For jumper settings related to the device operation mode, refer to the chapter 8.2.**

## Chapter 4 Power supply

### 4.1 Board power connection

For operation of the device, a supply voltage must be connected to the board. Though a single supply voltage is sufficient for the operation of the device, two (different) voltages can be supplied to the board.

Within this document the following voltages are considered as 'typical' connections:

*Voltage1* = 5.0V

*Voltage2* = 3.3V

The following connectors are available to supply those voltages:

Three 4mm 'banana-type' connectors:

- Two red connectors for voltages *Voltage1* (CN10) and *Voltage2* (CN11)
- A black connector for VSS connection on CN12

**Note:** The three connectors are supplied with the board but are not assembled.

- The E1 emulator that is used for debug purposes and flash programming can also supply a single operating voltage ('Dbg\_Voltage'). The voltage is programmable via the E1 GUI as 3.3 or 5.0V (typ). See the documentation of the E1 and chapter 5 'Debug and Programming interface' for details.
- In case the PiggyBoard is mounted on a MainBoard, the voltages *Voltage1* and *Voltage2* are supplied by the on-board regulators of the MainBoard.

**NOTE:** Do not supply any voltage directly to the PiggyBoard in case it is mounted on the MainBoard.

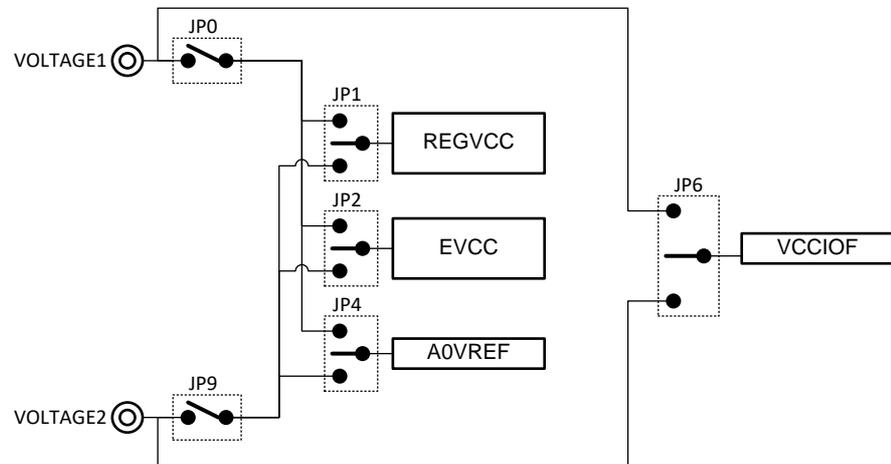
For each of the two voltages, 'Voltage 1' and 'Voltage 2', a green LED (LED1 and LED2) is available to signal that the related voltage is available on the PiggyBoard.

## 4.2 Voltage distribution

The table shows the required device power supply pins and their function:

Device supply pin	Function
REGVCC	Supply for the device <u>internal regulators</u> for the digital logic.
EVCC	Supply for <u>ports</u> of AWO area.
A0VREF	Supply for <u>ports</u> and <u>analog functions</u> of ADC0.
VDDIOF	IO supply voltage for components located on a connected mainboard.

- For each of the above voltages, the voltage source can be selected from *Voltage1* (typ. 5.0V) or *Voltage2* (typ. 3.3V) by the jumpers JP0, JP1, JP2, JP4, JP9 and JP6. See the picture below for details.



## Chapter 5 Clock sources

For mounting of the external crystal oscillator, a socket is available.

### 5.1.1 MainOsc

A crystal or ceramic resonator in the range of 8MHz to 24MHz can be mounted on socket X1.

A 8MHz and 16Mhz oscillator is supplied with the board.

## Chapter 6 Debug and Programming interface

For connection of the microcontroller debug and flash programming tools, the connector CN19 is provided.

The signal connection of the connector CN19 is shown in the picture below:

CN19 pin	Device Port	Device signal
1	JP0_2	DCUTCK / LPDCLK
2	GND	GND
3	JP0_4	DCUTRST
4	FLMD0	FLMD0
5	JP0_1	DCUTDO / LPDO
6	P10_8*	FLMD1
7	JP0_0	DCUTDI / LPDI
8	'Dbg_Voltage'	-
9	JP0_3	DCUTMS
10	-	-
11	JP0_5	DCURDY / LPDCLKOUT
12	GND	-
13	RESET	-
14	GND	-

\* In case the FLMD1 signal must be controlled by the debug/programming tool, the pin header JP11 must be closed.

The 'Dbg\_Voltage' (on CN19 pin 8) can be monitored by the debug and flash programming tools. Therefore it is possible to select either Voltage1 or the Voltage2 by pin header JP10:

JP10 pin	Selection for Dbg_Voltage
1-2	Voltage1 is selected
2-3	Voltage2 is selected

## Chapter 7 Connectors for ports of device

Connection to each pin of the device is possible via the connectors CN5 to CN8.

*Note :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.*

### 7.1 Connectors to MainBoard

Three connectors (CN1 to CN3) are available to connect the PiggyBoard to a MainBoard.

The signal connection of each connector is described in the following tables:

#### 7.1.1 Connector CN1 (RH850-F1X-100PIN-PB-T1-V3)

Pin	Function	Device Port	Pin	Function	Device Port
1	VOLTAGE1	-	2	VOLTAGE1	-
3	VOLTAGE1	-	4	VOLTAGE1	-
5	RESET	_RESET	6	NMI	P9_0
7	WAKE	-	8	-	-
9	INT0	P9_1	10	INT1	P0_6
11	INT2	P9_2	12	INT3	P9_3
13	-	-	14	-	-
15	UART0TX	P10_10	16	UART1TX	P0_5
17	UART0RX	P10_9	18	UART1RX	P0_4
19	LIN0TX	P10_10	20	LIN1TX	P0_8
21	LIN0RX	P10_9	22	LIN1RX	P0_7
23	IIC0SDL	P10_3	24	IIC1SDL	-
25	IIC0SDA	P10_2	26	IIC1SDA	-
27	CAN0TX	P10_1	28	CAN1TX	P0_3
29	CAN0RX	P10_0	30	CAN1RX	P0_2
31	SENTIN0	P8_0	32	SENTIN1	P9_0
33	SENTOUT0	P8_1	34	SENTOUT1	P9_1
35	PSI50Rx	-	36	PSI51Rx	-
37	PSI50Tx	-	38	PSI51Tx	-
39	PSI50Ssync	-	40	PSI51Sync	-
41	FLX0TX	P11_1	42	FLX0EN	P10_11
43	FLX0RX	P10_14	44	FLXSTPWT	P10_12
45	FLX1TX	P10_8	46	FX1EN	P10_13
47	FLX1RX	P10_9	48	FLXCLK	P10_10
49	-	-	50	-	-
51	ETH0MDIO	-	52	ETH0MDC	-
53	ETH0RXD0	-	54	EH0TXD0	-
55	ETH0RXD1	-	56	EH0TXD1	-
57	ETH0RXD2	-	58	EH0TXD2	-

Pin	Function	Device Port	Pin	Function	Device Port
59	ETH0RXD3	-	60	EH0TXD3	-
61	ETH0RXDCLK	-	62	ETH0TXCLK	-
63	ETH0RXER	-	64	ETH0TXER	-
65	ETH0CRSDV	-	66	ETH0TXEN	-
67	ETH0RXDV	-	68	ETH0COL	-
69	ETH0RESET	-	70	-	-
71	-	-	72	-	-
73	USB0UDMF	-	74	USB0UDMH	-
75	USB0UDPF	-	76	USB0UDPH	-
77	-	-	78	-	-
79	-	-	80	-	-
81	-	-	82	-	-
83	-	-	84	-	-
85	DIGIO_0	P8_0	86	DIGIO_1	P8_1
87	DIGIO_2	P8_2	88	DIGIO_3	P8_3
89	DIGIO_4	P8_4	90	DIGIO_5	P8_5
91	DIGIO_6	P8_6	92	DIGIO_7	P11_0
93	DIGIO_8	P10_0	94	DIGIO_9	P10_7
95	DIGIO_10	P10_8	96	DIGIO_11	P10_15
97	DIGIO_12	P0_9	98	DIGIO_13	P0_10
99	DIGIO_14	P0_11	100	DIGIO_15	P0_12
101	-	-	102	-	-
103	MUX0	P10_4	104	MUX1	P10_5
105	MUX2	P10_6	106	-	-
107	ADC0	AP0_0	108	ADC1	AP0_1
109	ADC2	AP0_2	110	ADC3	AP0_3
111	ADC4	AP0_4	112	ADC5	AP0_5
113	ADC6	AP0_6	114	ADC7	AP0_7
115	VDDIOF	-	116	VDDIOF	-
117	VOLTAGE2	-	118	VOLTAGE2	-
119	VOLTAGE2	-	120	VOLTAGE2	-

### 7.1.2 Connector CN2 (RH850-F1X-100PIN-PB-T1-V3)

Pin	Function	Device Port	Pin	Function	Device Port
1	CAN2Tx	P0_4	2	CAN3Tx	P11_4
3	CAN2Rx	P0_5	4	CAN3Rx	P11_3
5	CAN4Tx	P0_10	6	CAN5Tx	P11_6
7	CAN4Rx	P0_9	8	CAN5Rx	P11_5
9	LIN2Tx	P0_10	10	LIN3Tx	-
11	LIN2Rx	P0_9	12	LIN3Rx	-
13	LIN4Tx	P11_2	14	LIN5Tx	-
15	LIN4Rx	P11_1	16	LIN5Rx	-
17	LIN6Tx	-	18	LIN7Tx	-
Q	LIN6Rx	-	20	LIN7Rx	-
21	LIN8Tx	-	22	LIN9Tx	-
23	LIN8Rx	-	24	LIN9Rx	-
25	LIN10Tx	P10_10	26	LIN11Tx	P0_5
27	LIN10Rx	P10_9	28	LIN11Rx	P0_4
29	LIN12Tx	P10_14	30	LIN13Tx	P11_5
31	LIN12Rx	P10_13	32	LIN13Rx	P11_6
33	LIN14Tx	-	34	LIN15Rx	P10_11
35	LIN14Rx	-	36	LIN15Tx	P10_12
37	-	-	38	-	-
39	-	-	40	-	-
41	MLBCLK	-	42	MLBRESET	-
43	MLBSIG	-	44	MLBDAT	-
45	-	-	46	-	-
47	CAN6Tx	P10_4	48	CAN7Tx	P10_13
49	CAN6Rx	P10_5	50	CAN7Rx	P10_14
51	-	-	52	-	-
53	-	-	54	-	-
55	-	-	56	-	-
57	-	-	58	-	-
59	-	-	60	-	-
61	-	-	62	-	-
63	-	-	64	-	-
65	-	-	66	-	-
67	-	-	68	-	-
69	-	-	70	-	-
71	-	-	72	-	-
73	-	-	74	-	-
75	-	-	76	-	-
77	-	-	78	-	-
79	-	-	80	-	-
81	-	-	82	-	-
83	-	-	84	-	-

Pin	Function	Device Port	Pin	Function	Device Port
85	-	-	86	-	-
87	-	-	88	-	-
89	-	-	90	-	-
91	-	-	92	-	-
93	-	-	94	-	-
95	-	-	96	-	-
97	-	-	98	-	-
99	-	-	100	-	-
101	-	-	102	-	-
103	-	-	104	-	-
105	-	-	106	-	-
107	-	-	108	-	-
109	-	-	110	-	-
111	-	-	112	-	-
113	-	-	114	-	-
115	-	-	116	-	-
117	-	-	118	-	-
119	-	-	120	-	-

### 7.1.3 Connector CN3 (RH850-F1X-100PIN-PB-T1-V3)

Pin	Function	Device Port	Pin	Function	Device Port
1	PWM00	P10_0	2	PWM01	P10_1
3	PWM02	P10_2	4	PWM03	P10_3
5	PWM04	P10_7	6	PWM05	P10_8
7	PWM06	P10_9	8	PWM07	P10_10
9	PWM08	P9_0	10	PWM09	P9_1
11	PWM10	P0_4	12	PWM11	P0_1
13	PWM12	P0_2	14	PWM13	P0_3
15	PWM14	P8_0	16	PWM15	P8_1
17	PWM16	P10_11	18	PWM17	P10_12
19	PWM18	P10_13	20	PWM19	P10_14
21	PWM20	P9_2	22	PWM21	P9_3
23	PWM22	P8_2	24	PWM23	P8_3
25	PWM24	P10_14	26	PWM25	P11_0
27	PWM26	P11_1	28	PWM27	P11_2
29	PWM28	P11_3	30	PWM29	P11_4
31	PWM30	P11_5	32	PWM31	P11_6
33	PWM32	P11_7	34	PWM33	P9_4
35	PWM34	P9_5 or P0_11	36	PWM35	P9_6 or P0_6
37	PWM36	P8_4	38	PWM37	P8_5
39	PWM38	P8_6	40	PWM39	P8_7

Pin	Function	Device Port	Pin	Function	Device Port
41	PWM40	P8_8	42	PWM41	P8_9
43	PWM42	P8_10	44	PWM43	P8_11
45	PWM44	P8_12	46	PWM45	P0_12
47	PWM46	P0_13	48	PWM47	P0_14
49	PWM48	-	50	PWM49	-
51	PWM50	-	52	PWM51	-
53	PWM52	-	54	PWM53	-
55	PWM54	-	56	PWM55	-
57	PWM56	-	58	PWM57	-
59	PWM58	-	60	PWM59	-
61	PWM60	-	62	PWM61	-
63	PWM62	-	64	PWM63	-
65	PWM64	-	66	PWM65	-
67	PWM66	-	68	PWM67	-
69	PWM68	-	70	PWM69	-
71	PWM70	-	72	PWM71	-
73	PWM72	-	74	PWM73	-
75	PWM74	-	76	PWM75	-
77	PWM76	-	78	PWM77	-
79	PWM78	-	80	PWM79	-
81	PWMADC00	AP0_8	82	PWMADC01	AP0_9
83	PWMADC02	AP0_10	84	PWMADC03	AP0_11
85	PWMADC04	AP0_12	86	PWMADC05	AP0_13
87	PWMADC06	AP0_14	88	PWMADC07	AP0_15
89	PWMADC08	-	90	PWMADC09	-
91	PWMADC10	-	92	PWMADC11	-
93	PWMADC12	-	94	PWMADC13	-
95	PWMADC14	-	96	PWMADC15	-
97	-	-	98	-	-
99	-	-	100	-	-
101	-	-	102	-	-
103	-	-	104	-	-
105	-	-	106	-	-
107	-	-	108	-	-
109	-	-	110	-	-
111	-	-	112	-	-
113	-	-	114	-	-
115	-	-	116	-	-
117	-	-	118	-	-
119	-	-	120	-	-

Other

## Chapter 8 Other circuitry

### 8.1 Push button for RESET

In order to issue a RESET to the device, the push-button SW1 is available.

### 8.2 Mode Selection

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

- FLMD0 via jumper JP25
- FLMD1 via jumper JP19
- MODE0 via jumper JP28
- MODE1 via jumper JP26
- MODE2 via jumper JP27

To apply “High” or “Low” to the mode pins, the pins 1 and 2, or the pins 2 and 3 (if available) of the corresponding jumper must be closed, respectively.

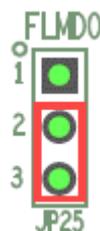
**Note:** Pin 1 of all jumpers is marked by a small circle.

**CAUTION:** Be careful in configuration of mode related pins. Wrong configuration and operation of the device outside of its specification can cause irregular behaviour of the device and long term damage cannot be excluded. Be sure to check the corresponding User's Manual for details, which modes are specified for the used device.

**Note:**

In the very most cases the ‘Normal operating mode’ of the device will be used. This mode is for execution of the user program. The on-chip debug functions also use this mode.

To select the ‘Normal operating mode’ of the device, the FLMD0 pin must be pulled low. To do so, **close** the pins 2-3 on the jumper JP25:



All other jumper related to the mode selection can be left open.

### 8.3 Signalling LEDs

Eight LEDs are provided to allow visual observation of the output state of device port pins. Device pins P8\_0 to P8\_7 are connected to the odd pins 1 to 15 of the pin header CN13, while the LEDs 1 to 8 are connected to the even pins 2 to 16, respectively.

Thus the LEDs can be either connected to

- the device port pins P8\_0 to P8\_7 by closing the connection on CN13 using a jumper, or
- any device port pin by using the provided wire connections.

## Chapter 9 Precautions

### 9.1 Usage of LIN15

On piggyback board V3 the LIN15 Rx/Tx signals on CN2 have been crossed.

Port P10\_11 is LIN15RX, but it is connected to LIN15TX.

Port P10\_12 is LIN15TX, but it is connected to LIN15RX.

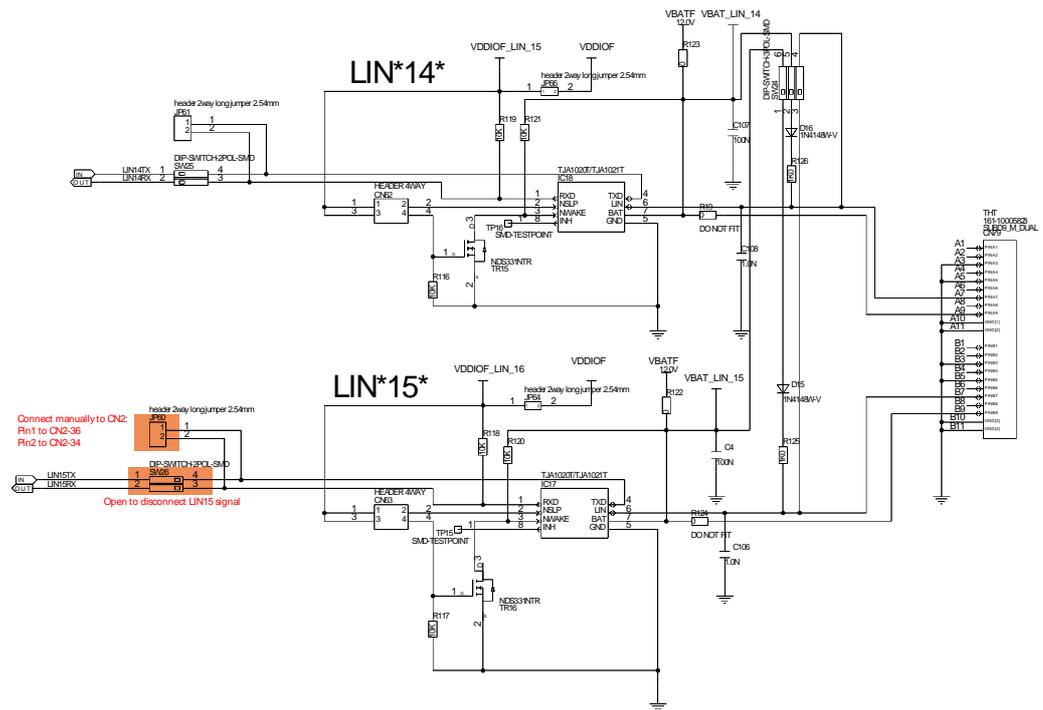
In order to fix this it is best to make the appropriate modifications on the RH850/X1x Network Main Board (Y-RH850-X1X-MB-T2-V1 or Y-RH850-X1X-MB-T2-V2) or on the RH850/X2x Main Board (Y-RH850-X2X-MB-T1-V1).

#### 9.1.1 Adjustments on RH850/X1x Network Main Board

In order to use LIN15 on the RH850/X1x Network Main Board following modifications on the main board are needed:

1. Disconnect LIN15Tx and LIN15Rx from connector CN2 by setting switch SW26-1 and SW26-2 to "OFF".
2. Connect LIN15Tx manually from jumper JP60-1 to connector CN2-36.
3. Connect LIN15Rx manually from jumper JP60-2 to connector CN2-34.

Please see below picture for the necessary changes.



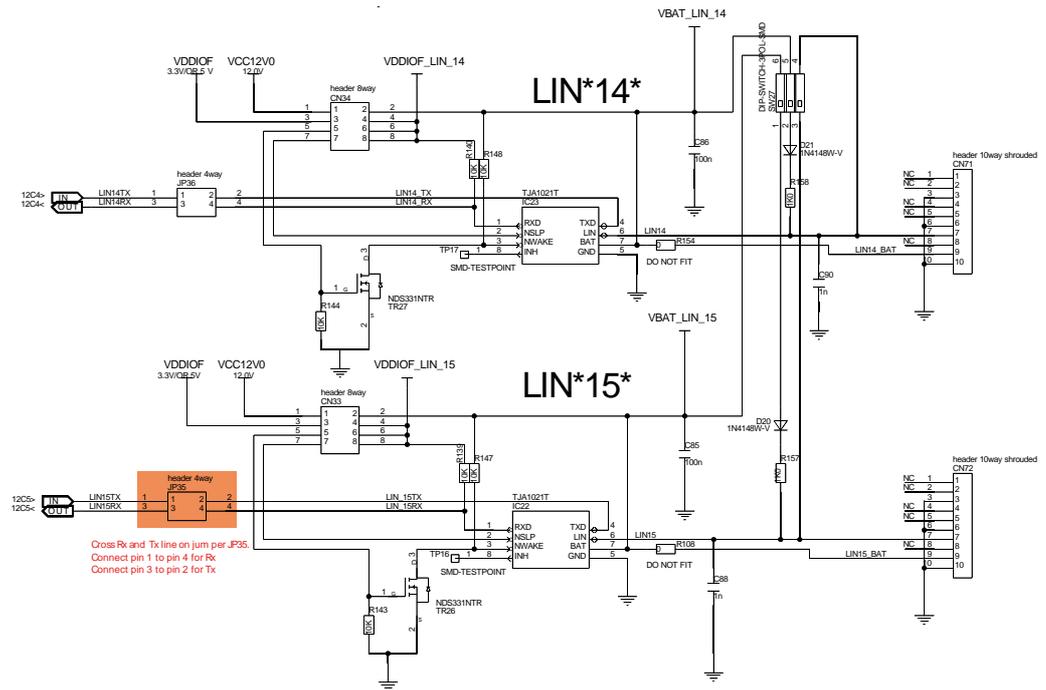
### 9.1.2 Adjustments on RH850/X2x Main Board

To be able to use LIN15 with the RH850/X2x Main Board changes are very simple.

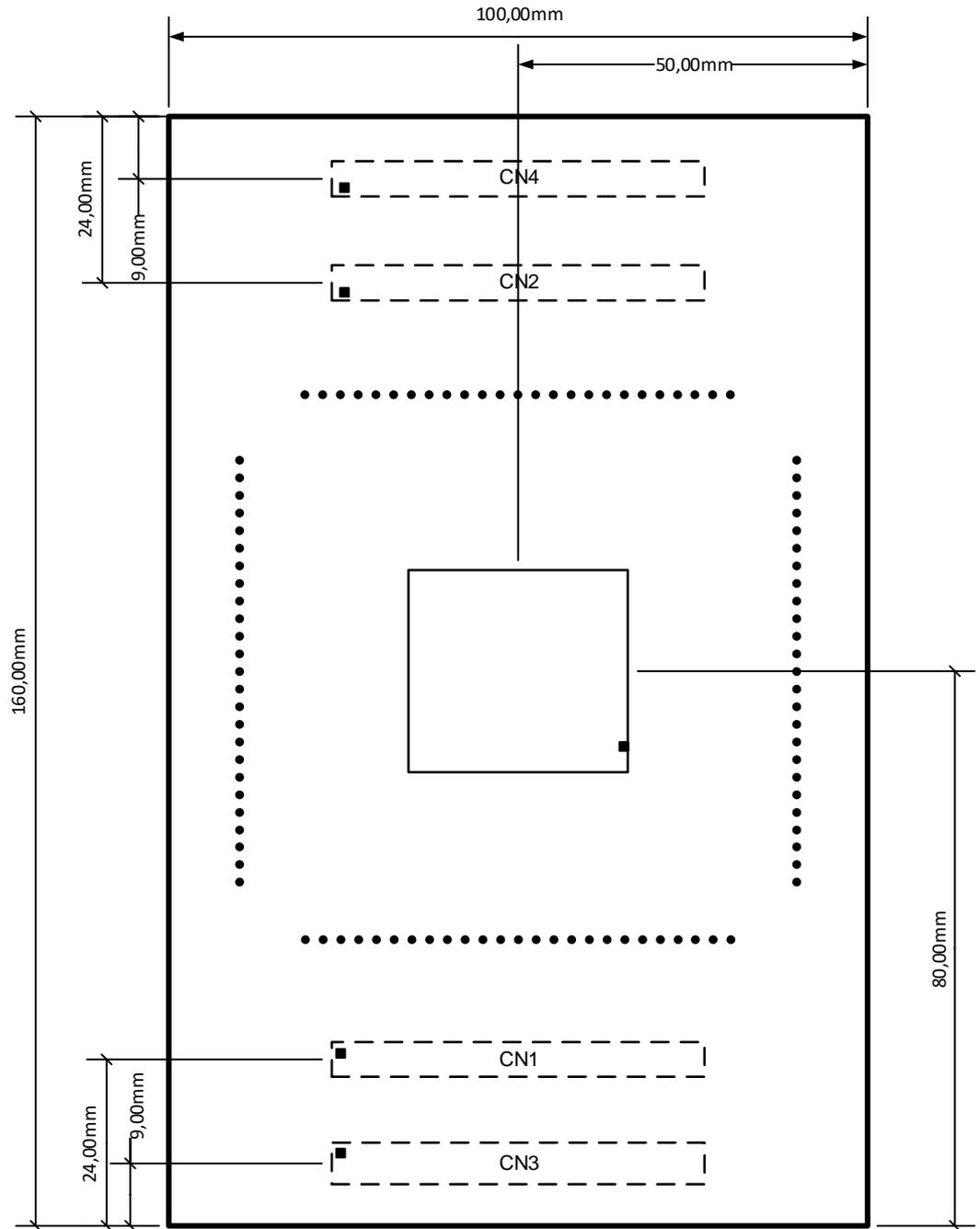
On RH850/X2x Main Board the connection of LIN15Tx and LIN15Rx to connector CN2 is by jumper JP35. This can be modified easily to accommodate the pin swap on CN2:

1. Remove the jumpers on JP35.
2. On JP35 connect JP35-1 with JP35-4 for LIN15Rx.
3. On JP35 connect JP35-2 with JP35-3 for LIN15Tx

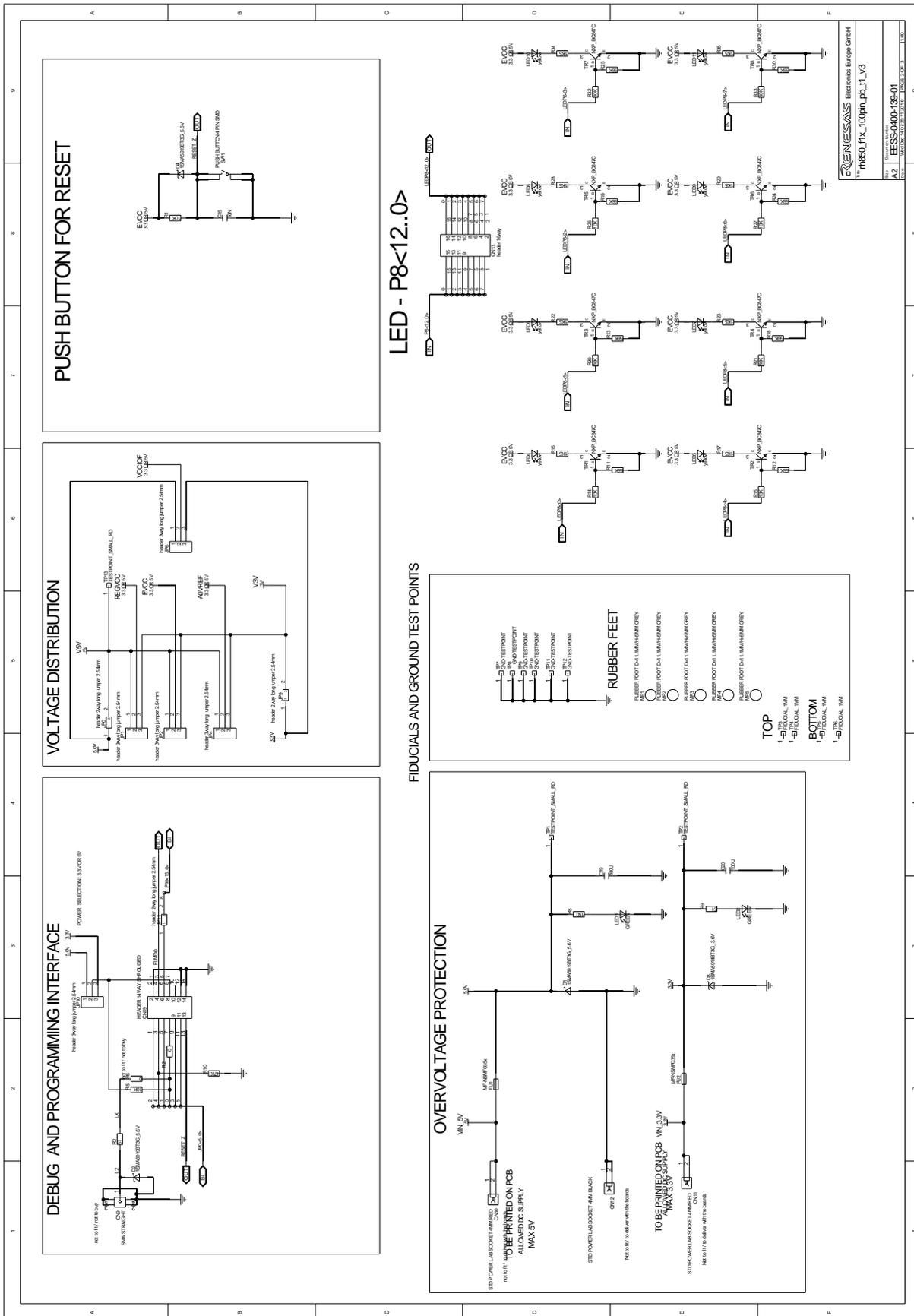
Please see below picture for the necessary changes.



# Chapter 10 Mechanical dimensions

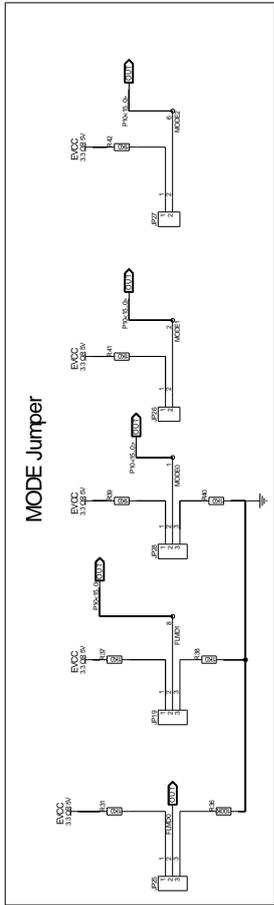
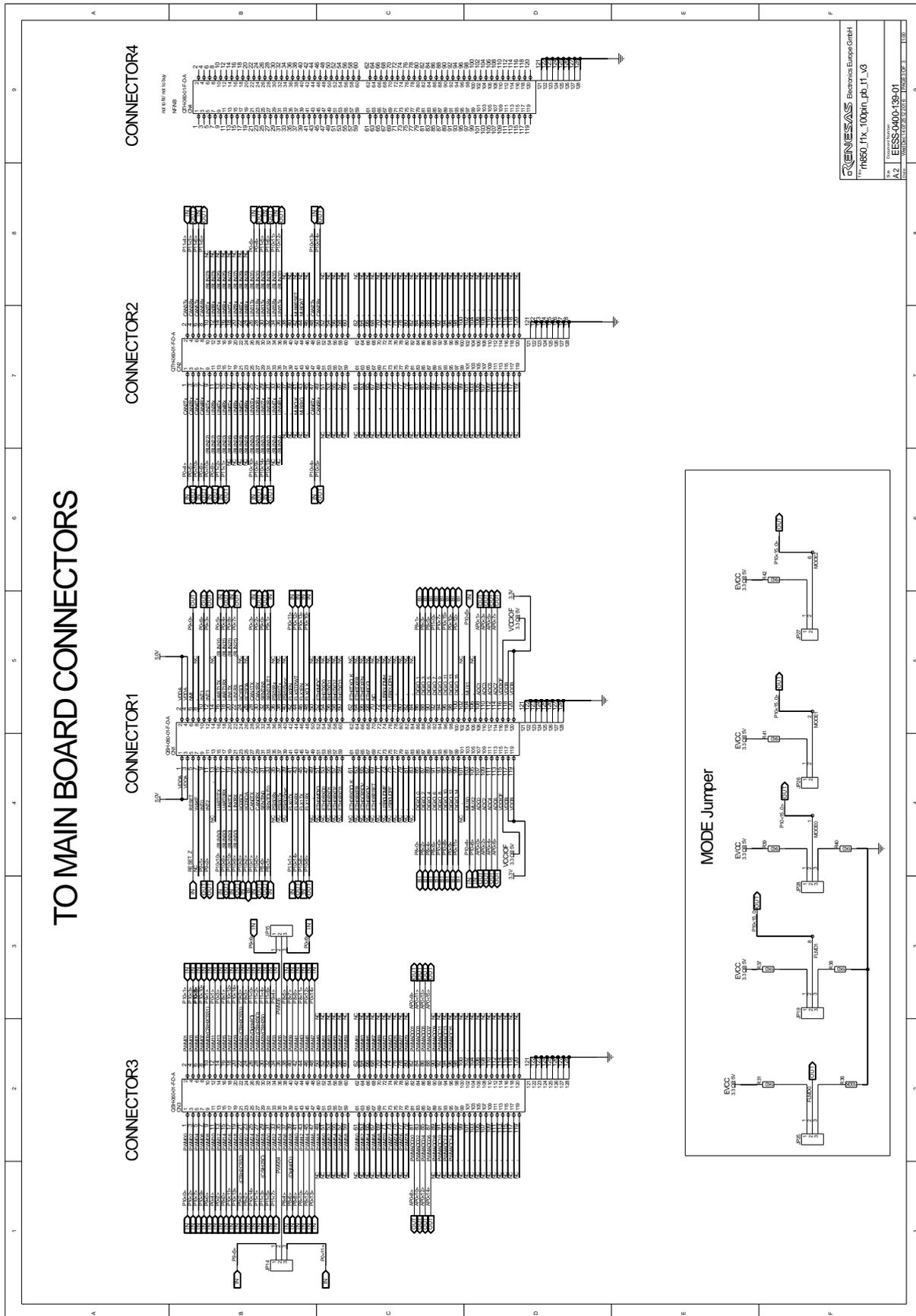






These intangible goods are not subject to Annex 1 of common Dual-Use list (428/2009) in its current version.

TO MAIN BOARD CONNECTORS



These intangible goods are not subject to Annex 1 of common Dual-Use list (428/2009) in its current version.

## Chapter 12 Revision History

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

Date	Version	Description
2016-11-25	1.0	Initial release
2019-11-27	1.01	Added precaution for LIN15 signal on connector CN2

Main differences to the RH850-F1X-100PIN-PB-T1-V2:

- Added support for the RH850/F1KM-S1 and RH850/F1KM-S4 device. This mainly relates to the added jumpers on page 1 of the schematic for the device pin selection.
- Modified signals on CN1, CN2 and CN3.
- Added functionality for the mode selection of the device.
- Added signalling LEDs.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Renesas Electronics:](#)

[Y-RH850-F1X-100PIN-PB-T1-V3](#)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.