User's Manual

32

RH850 Evaluation Platform

RH850/X1x MainBoard

Y-RH850-X1X-MB-T1-V1

Table of Contents

Chapter 1 Introduction

The RH850/X1x Application Board serves as a simple and easy to use platform for evaluating the features and performance of Renesas Electronics' 32-bit RH850/X1x microcontrollers. The Main Board (Y-RH850-X1X-MB-T1-V1) can be used as a standalone board, or can be mated with one of several Piggyback Boards (e.g. Y-RH850-F1X-176PIN-PB-T1-V1) for extended functionality.

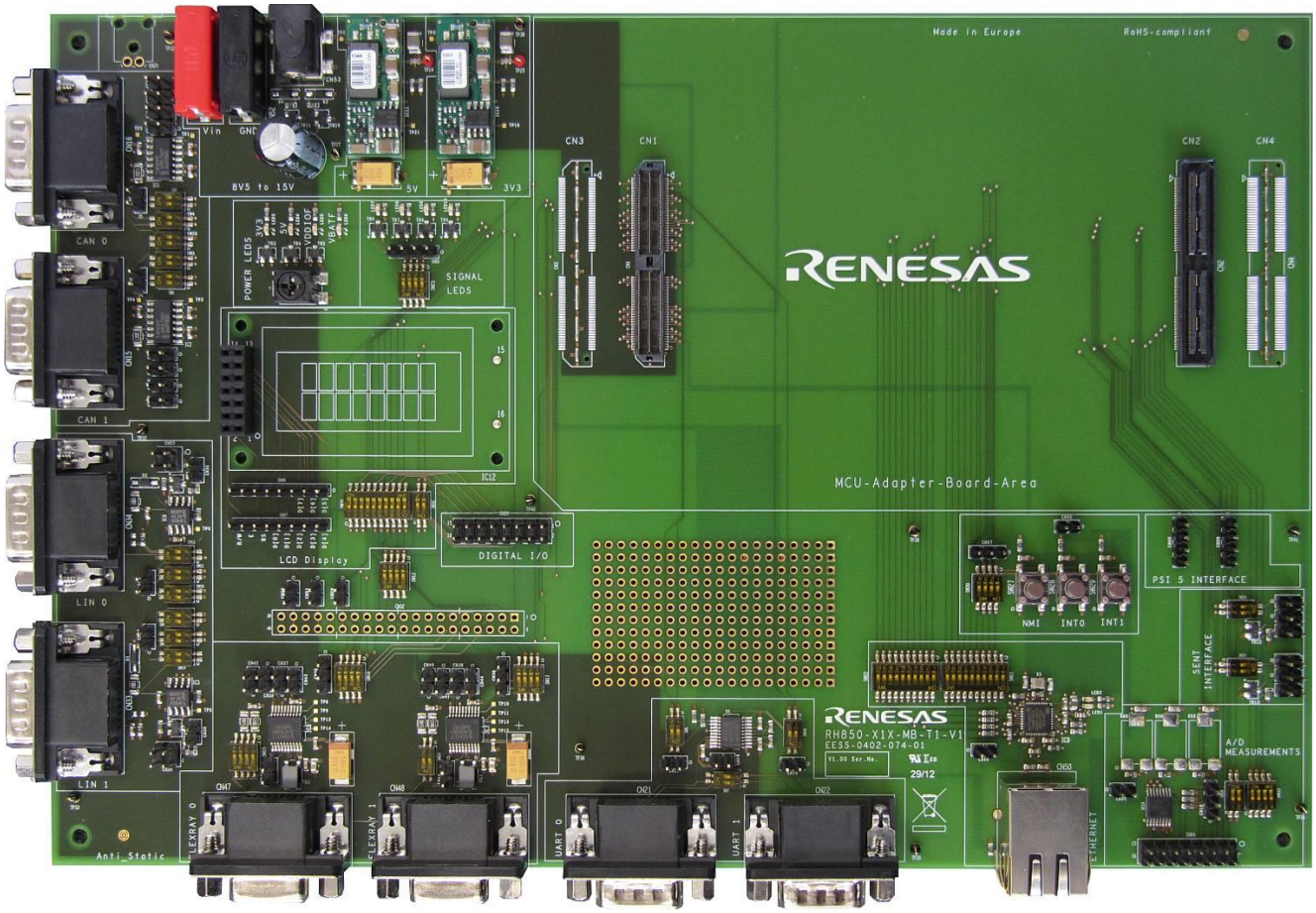
Features:

- User interaction through switches, buttons and LEDs
- Connections for various serial interfaces like RS232, LIN, CAN, FlexRay, Ethernet and PSI5.
- High density piggyback board connectors
- Single 12V board power supply with onboard voltage regulators
- Through-hole prototyping area

This document will describe the functionality provided by the Application Board and guide the user through its operation. For details regarding the operation of the microcontroller, refer to the RH850/X1x User Manual.

1.1 Board Overview

The figure below provides a view of the Main Board.



Chapter 2 Power Supply

A typical voltage of 12V must be supplied to the board. The required voltages for operation of the onboard modules (3.3V and 5.0V) are derived from this voltage by dedicated voltage regulators.

Details of the board power supply are described in the chapters below.

2.1 Power connectors

The board operation voltage is supplied to the board by the following connectors:

Table 2-1

Connector	Description	Function
CN54	4mm red laboratory connector	12V supply
CN52	4mm black laboratory connector	VSS/GND supply
CN53	2.1mm coaxial connector	12 V & VSS/GND supply: Tip: 12V Barrel: VSS/GND

A blue LED (LED6) signals the availability of the 12V board supply voltage.

Caution:
Do not supply different voltages to CN54/CN52 and CN53 simultaneously.

Note:

The board is shipped with a 12V/1A output AC/DC converter. The output of the converter can be connected directly to the 2.1mm coaxial connector CN53.

Depending on the used PiggyBoard or the devices operating condition (e.g. use of trace function), the converter's power rating of 12W may not be sufficient for operation of the MainBoard and the PiggyBoard. In that case use an AC/DC converter with a higher power rating or use a laboratory power supply with a matching rating at the connectors CN54/CN52.

2.2 Voltage Regulators

Two DC/DC regulators are available for generation of 3.3V and 5.0V for use by device modules. For each voltage a LED signals generation of the related voltage (see table 2-2 below).

Table 2-2

Regulator	Description	Signal LED
IC11	5.0V (typical)	LED4
IC10	3.3V (typical)	LED3

2.3 Other voltages

2.3.1 IO voltage

For some of the board modules, it is possible to input a dedicated IO voltage different from the module supply voltage.

This IO voltage (named VDDIOF) is not generated on the MainBoard, but must be set on the PiggyBoard. Still, availability of the voltage is signaled by LED5.

Refer to the documentation of the PiggyBoard on how to set the IO voltage.

2.3.2 Module supply voltage

The supply voltage of each module must be set by jumper. Refer to the description of each module within this document for details.
For some modules (e.g. Ethernet) the signal voltage level is defined by its supply voltage. Therefore the related port voltage of the device on the PiggyBoard must be configured for the same voltage level as the module's supply voltage.

2.3.3 Miscellaneous settings

The supply voltage of the microcontroller device on the PiggyBoard is derived from the output of the two DC/DC regulators on the MainBoard. The selection of which voltage the device will operate from, must be done on the PiggyBoard. Therefore refer to the documentation of the PiggyBoard voltage supply for details.

Chapter 3 Board functions

This section describes functions and modules that are available on the MainBoard.

3.1 UART Interface

Two UART interfaces, with RS232 drivers are provided on the board.

To connect the UART signals of the device available on CN1 (Piggyboard device connector) to the UART transceivers, close SW6 for UART0 and SW18 for UART1.
In case different device signals shall be connected to the UART transceivers, the headers CN17 (for UART0) and CN70 (for UART1) can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the UART transceiver.

To supply the voltage for the UART transceiver (MAX3222), the pin header CN19 must be closed.

To enable an on-board loop of UART0 to UART1, the switch SW7 can be closed.

The table 3-1 shows the signal mapping of the UART DSUB connectors:

Table 3-1

DSUB Connector	UART Interface	Pin Number	Function
CN21	UART0	2	Rx
		3	Tx
		5	GND
		Others	-
CN22	UART1	2	Rx
		3	Tx
		5	GND
		Others	-

3.2 LIN Interface

Two LIN interfaces, with LIN signal level (VDD), are provided on the board.

To connect the LIN signals of the device available on CN1 (Piggyboard device connector) to the LIN interfaces, close SW10 for LIN0 and SW8 for LIN1.
As often LIN and UART signals are shared by the same macro of the device switches SW11 (for UART0 signals) and SW9 (for UART1 signal) are provided to connect the UART signals of CN1 to the LIN drivers.
In case different device signals shall be connected to the LIN interface, the headers CN24 and CN23 can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the LIN drivers.

To supply the voltage for the LIN driver (TJA1020T or TJA 1021T), the pin header CN31 (for LIN0) and CN30 (for LIN1) must be closed.

To enable an on-board loop of LIN0 to LIN1, the switch SW14 can be closed.

Several pin headers are provided to configure the inputs of the LIN driver (TJA1020T or TJA1021T). For details refer to the schematic and the reference documentation of the LIN driver.

This table 3-2 shows the signal mapping of the LIN DSUB connectors:

Table 3-2

DSUB Connector	LIN Interface	Pin Number	Function
CN34	LIN0	3, 5	GND
		7	LIN
		Others	-
CN33	LIN1	3, 5	GND
		7	LIN
		Others	-

3.3 CAN Interface

Two CAN interfaces (CAN0, CAN1) with CAN signal levels are provided on the board.

To connect the CAN signals of the device available on CN1 (Piggyboard device connector) to the CAN interfaces, close SW2 for CAN0 and SW1 for CAN1.
In case different device signals shall be connected to the interface the headers CN6 (for CAN0) and CN5 (for CAN1) can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the CAN drivers.

To supply the IO voltage for the CAN transceivers (TJA1041AT), the pin header CN8 (for CAN0) and CN7 (for CAN1) must be closed.

Several pin headers are provided to configure the inputs of the CAN driver (TJA1041AT). For details refer to the schematic and the reference documentation of the CAN driver.

To enable an on-board loop of CAN0 to CAN1, the switch SW4 can be closed.

This table 3-3 shows the signal mapping of the two DSUB connectors:

Table 3-3

DSUB Connector	CAN Interface	Pin Number	Function
CN16	CAN0	2	CANL
		3	-
		7	CANH
		Others	-
CN15	CAN1	2	CANL
		3	-
		7	CANH
		Others	-

3.4 FlexRay Interface

Two FlexRay interfaces (FLEX0, FLEX1), with FlexRay signal level, are provided on the board.

To connect the FlexRay signals of the device available on CN1 (Piggyboard device connector) to the FlexRay interfaces, close SW16 for FLEX0 and SW17 for FLEX1.
In case different device signals shall be connected to the interface, the headers CN35 (for FLEX0) and CN36 (for FLEX1) can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the FlexRay drivers.

To supply the IO voltage for the CAN drivers (TJA1080ATS), the pin header CN37 (for FLEX0) and CN38 (for FLEX1) must be closed.

Several pin headers are provided to configure the inputs of the CAN driver (TJA1080ATS). For details refer to the schematic and the reference documentation of the FlexRay driver.

To enable an on-board loop of FLEX0 to FLEX1, the switch SW15 can be closed.

This table 3-4 shows the signal mapping of the two DSUB connectors:

Table 3-4

DSUB Connector	CAN Interface	Pin Number	Function
CN47	FLEX0	2	FLEX0_BM
		4	FLEX1_BM
		7	FLEX0_BP
		8	FLEX1_BP
		Others	-
CN48	FLEX1	2	FLEX1_BM
		7	FLEX1_BP
		Others	-

3.5 Ethernet Interface

One Ethernet interface, with Ethernet signal level, is provided on the board.

To connect the Ethernet signals of the device available on CN1 (Piggyboard device connector), to the Ethernet interface, close SW21 and SW22.

To enable the 3.3V power for operation of the Ethernet Phy (LAN8700), close the header CN49.
Note: The ports of the device on the PiggyBack board that hold the Ethernet signals must also be configured for 3.3V operation. Check the UM of the PiggyBack board for details.

The RJ45 connector CN50 is used for connection of the Ethernet cable.

For available signals on the RJ45 connector, refer to the related chapter of the schematic.

3.6 PSI5 Interface

For connection of line drivers for the PSI5 interface, the headers CN59 and CN60 are available.

The headers connect to the following signals on the PiggyBoard connector CN1:

Table 3-5

Header	PSI Interface	Pin Number	Function	Signal on CN1
CN59	0	1	PSI5_0_Rx	PSI50Rx
		2	PSI5_0_Tx	PSI50Tx
		3	PSI5_0_SYNC	PSI50Sync
		4	GND	-
CN60	1	1	PSI5_1_Rx	PSI51Rx

Header	PSI Interface	Pin Number	Function	Signal on CN1
		2	PSI5_1_Tx	PSI51Tx
		3	PSI5_1_SYNC	PSI51Sync
		4	GND	-

3.7 SENT Interface

For connection of sensors with a SENT interface, two line drivers implementation are provided.
To connect the SENT signals of the device, available on CN1 (Piggyboard device connector), to the SENT interfaces, close SW24 (for SENT0) and SW25 (for SENT1).

To connect sensors to the line drivers, the connectors CN57 and CN62 can be used.

To supply the IO voltage for the SENT drivers the pin header CN58 (for SENT0) and CN63 (for SENT1) must be closed.

In case different device signals shall be connected to the interface the headers CN56 (for SENT0) and CN61 (for SENT1) can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the SENT drivers.

This table 3-6 shows the signal mapping of the two SENT connectors:

Table 3-6

Header	SENT Interface	Pin Number	Function
CN57	0	1	SENT0RxTx
		2	GND
CN62	1	1	SENT1RxTx
		2	GND

3.8 Digital IOs

Up to 16 device signals with digital IO functionality are available on connector CN69.

Table 3-7

Header	Pin Number	Signal on CN1
CN69	1	DIGIO_0
	2	DIGIO_1
	3	DIGIO_2
	4	DIGIO_3
	5	DIGIO_4
	6	DIGIO_5
	7	DIGIO_6
	8	DIGIO_7
	9	DIGIO_8
	10	DIGIO_9
	11	DIGIO_10

Header	Pin Number	Signal on CN1
	12	DIGIO_11
	13	DIGIO_12
	14	DIGIO_13
	15	DIGIO_14
	16	DIGIO_15

3.9 Push Buttons

To trigger user actions as device interrupts, three push button are available. The push buttons can trigger the following interrupts:

- SW27: Triggers NMI
- SW28: Triggers INT0
- SW29: Triggers INT1

To connect the interrupt signals of the device available on CN1 (Piggyboard device connector) to the push buttons, close SW30.

To supply the IO voltage for the push buttons, the pin header CN65 must be closed.

In case different device signals shall be connected to the push buttons, the headers CN67 can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the push buttons drivers.

Table 3-8

Push button	Default signal on CN1	Switch to enable the default connection	Header for alternative connection
SW27	NMI	SW30.1	CN67.1
SW28	INT0	SW30.2	CN67.2
SW29	INT1	SW30.3	CN67.3

3.10 Analog measurements

In order to perform some sample measurement with the PiggyBack board device Analog/Digital Converter, three potentiometers are provided. Additionally a multiplexer device for analog signals (74HC4051 type) is provided on the board as IC13.

To supply the IO voltage for the potentiometers and the multiplexer, the pin header CN66 must be closed.

To connect the analog signals of the device available at CN1 (Piggyboard device connector) to the potentiometers and the multiplexer, close the related pin headers on CN64 (see table 3-10).

The address select input pins of the multiplexer are controller by the MUX0-MUX2 signals available on CN1. To connect the multiplexer inputs to those signals, close SW33.

In case different signals than those available on CN1 shall be used to control the multiplexer address select inputs, the pin header CN18 is available

To connect the interrupt signals of the device available on CN1 to the push buttons close SW30.

Table 3-9

Multiplexer analog input	Pin header for signal connection	Connected Potentiometer
0	CN64.9	R55
1	CN64.10	R58
2	CN64.11	-
3	CN64.12	-
4	CN64.13	-
5	CN64.14	-
6	CN64.15	-
7	CN64.16	-

Table 3-10

CN64	Signal	CN1 signal
1	-	ADC0
2	-	ADC1
3	-	ADC2
4	-	ADC3
5	-	ADC4
6	-	ADC5
7	R60	ADC6
8	Multiplexer output	ADC7

3.11 Signal LEDs

Four LEDs, LED7 to LED10, are provided to allow visual observation of microcontroller output port states.

The power supply of the LEDs is derived directly from the primary board supply voltage (typical 12V).

To connect the signals of the device available at CN1 (Piggyboard device connector) to the LEDs, close the switches on SW23 (see table below).

In case different device signals shall be connected to the signal LEDs, the headers CN55 can be used. Connect a small wire between the related signals of the device on the PiggyBoard and the signal LEDs. See the table below for details.

Table 3-11

LED	Switch SW23	Alternative signal connection	CN1 signal
LED10	1-8	CN55.1	DIGIO_0
LED9	2-7	CN55.2	DIGIO_1
LED8	3-6	CN55.3	DIGIO_2
LED7	4-5	CN55.4	DIGIO_3

3.12 LCD Interface

An 8-characters x 2-lines display is provided with the MainBoard. The display must be placed on the connectors of IC12.

Control of the display is provided by means of 11 digital IO signals available on CN1.

To connect the signals of the device available at CN1 (Piggyboard device connector) to the Display, close the switches on SW31 and SW32.

In case different device signals shall be connected to the LCD display, the headers CN27 can be used, for small wire connections.

The contrast of the display can be adjusted manually using the potentiometer R61.

Chapter 4 Precautions

4.1 LCD Interface

Description:

When a display is placed on the connector of IC12, it might not be possible to connect to the device on a mounted PiggyBoard using the PG-FP5 or E1.

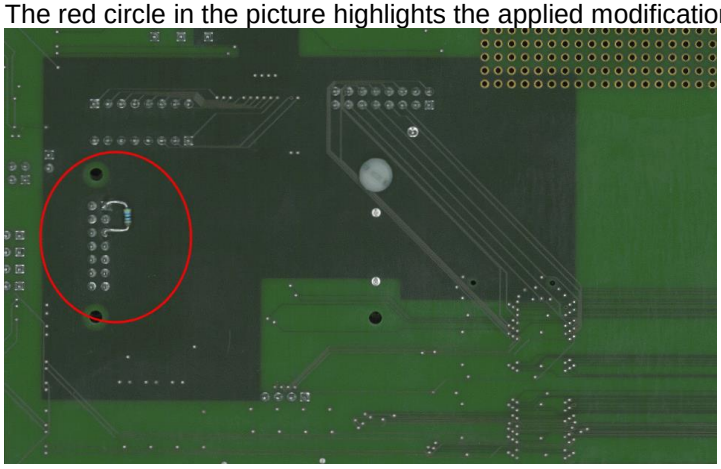
Applicable products:

The above mentioned description is applicable to the products with the following board revision(s) / serial number(s):

- Board revisions: EESS-0402-074-01
  EESS-0402-074-02
- Serial numbers: CA2070011D to CA2070060D
  CA2070087D
  CA20Y0061D to CA20Y0088D
  CA20Y0090D to CA20Y0102D
  CA20Y0104D to CA20Y0110D
  CA3010111D to CA3010130D

Applicable workaround / solutions:

1) Either do not mount the display onto the connector IC12
2) Or connect a pull-down resistor of 4.7kΩ between the pin #1 and #5 of the connector IC12.
   The red circle in the picture highlights the applied modification



4.2 Ethernet Interface

Description:

The Ethernet Interface cannot be used due to missing 50Ω pull-up resistors to 3.3V on the following signal lines of IC9 (LAN8700):

- TXN (pin 28)
- TXP (pin 29)
- RXN (pin 31)
- RXP (pin 32)

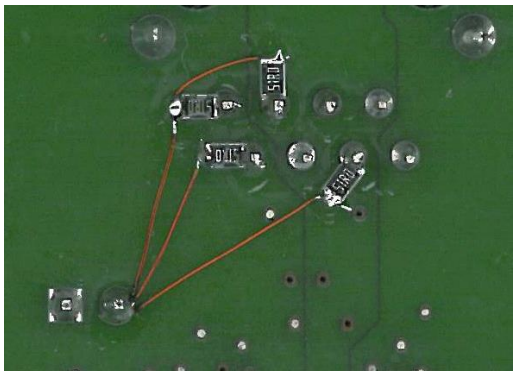
Applicable products:

The above mentioned description is applicable to the products with the following board revision(s):

Board revisions: EESS-0402-074-01
EESS-0402-074-02

Applicable workaround / solutions:

The picture below shows the required modifications:



The four missing resistors are soldered on the bottom side of the PCB directly to the related pins of the Ethernet connector and are wired to 3.3V voltage close-by.

4.3 CAN interfaces

Description:

The CAN connectors CN16 (CAN0) and CN15 (CAN1) do not provide the specified signal layout as shown in chapter 3.3. Instead, the signals of CANL and CANH are switched:

CANL is located on pin 7 instead of pin 2
CANH is located on pin 2 instead of pin 7

Applicable products:

The above mentioned description is applicable to the products with the following board revision(s) and/or serial number(s):

Board revision: EESS-0402-074-03
Serial numbers: CA3010361D to CA3010439D

Applicable workaround / solutions:

1. Please contact your board supplier for a repair / replacement.
   European customers can use the following link:
   http://www2.renesas.eu/support_all/registrations/hardware_upgrade/
2. Exchange the female DSUB connectors (CN16 and CN15) to male DSUB connectors.
3. Use a modified cable that exchanges the signals CANL and CANH to compensate the signal switch.

Chapter 5 Revision History

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

Date	Version	Description
2012-08-17	1.0	Initial release
2013-03-15	1.1	Added chapter ‘Precautions’
2014-05-06	1.2	• Added serial number information in chapter 4.1 ‘Precautions’ • Added IOVDD to CN1 • Added precaution for the Ethernet interface in chapter 4.1 • Updated schematics
2014-06-18	1.3	• Updated: Chapter 4 Precautions • Added precaution for CAN interfaces (chapter 4.3)
2014-12-19	1.4	• Add information about voltage configurations in chapters 2.3.2 and 3.5
2015-10-06	1.5	• Update schematics (formatting changes only)
2018-06-21	1.6	• Added TJA1021T as mounted driver for the LIN interface. • Added Note in chapter 2.1
2018-09-11	1.7	• Corrected UART signal assignment in Table 3-1

Chapter 6 Appendix A: PiggyBoard connector CN1

Pin	Function		Pin	Function
1	VDDA		2	VDDA
3	VDDA		4	VDDA
5	RESET		6	NMI
7	WAKE		8	-
9	INT0		10	INT1
11	INT2		12	INT3
13	-		14	-
15	UART0TX		16	UART1TX
17	UART0RX		18	UART1RX
19	LIN0TX		20	LIN1TX
21	LIN0RX		22	LIN1RX
23	IIC0SDL		24	IIC1SDL
25	IIC0SDA		26	IIC1SDA
27	CAN0TX		28	CAN1TX
29	CAN0RX		30	CAN1RX
31	SENTIN0		32	SENTIN1
33	SENTOUT0		34	SENTOUT1
35	PSI50Rx		36	PSI51Rx
37	PSI50Tx		38	PSI51Tx
39	PSI50Snyc		40	PSI51Sync
41	FLX0TX		42	FLX0EN
43	FLX0RX		44	-
45	FLX1TX		46	FX1EN
47	FLX1RX		48	FLX reserved
49	-		50	-
51	ETH0MDIO		52	ETH0MDC
53	ETH0RXD0		54	EH0TXD0
55	ETH0RXD1		56	EH0TXD1
57	ETH0RXD2		58	EH0TXD2
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	86	DIGIO_1
87	DIGIO_2	88	DIGIO_3
89	DIGIO_4	90	DIGIO_5
91	DIGIO_6	92	DIGIO_7
93	DIGIO_8	94	DIGIO_9
95	DIGIO_10	96	DIGIO_11
97	DIGIO_12	98	DIGIO_13
99	DIGIO_14	100	DIGIO_15
101	-	102	-
103	MUX0	104	MUX1
105	MUX2	106	-
107	ADC0	108	ADC1
109	ADC2	110	ADC3
111	ADC4	112	ADC5
113	ADC6	114	ADC7
115	IOVDD	116	IOVDD
117	VDDB	118	VDDB
119	VDDB	120	VDDB

Chapter 7 Appendix B: PiggyBoard connector CN2

Pin	Function		Pin	Function
1	CAN2Tx		2	CAN3Tx
3	CAN2Rx		4	CAN3Rx
5	CAN4Tx		6	CAN5Tx
7	CAN4Rx		8	CAN5Rx
9	LIN2Tx		10	LIN3Tx
11	LIN2Rx		12	LIN3Rx
13	LIN4Tx		14	LIN5Tx
15	LIN4Rx		16	LIN5Rx
17	LIN6Tx		18	LIN7Tx
19	LIN6Rx		20	LIN7Rx
21	LIN8Tx		22	LIN9Tx
23	LIN8Rx		24	LIN9Rx
25	LIN10Tx		26	LIN11Tx
27	LIN10Rx		28	LIN11Rx
29	LIN12Tx		30	LIN13Tx
31	LIN12Rx		32	LIN13Rx
33	LIN14Tx		34	LIN15Tx
35	LIN14Rx		36	LIN15Rx
37	-		38	-
39	-		40	-
41	MLBCLK		42	MLBRESET
43	MLBSIG		44	MLBDAT
45	-		46	-
47	-		48	-
49	-		50	-
51	-		52	-
53	-		54	-
55	-		56	-
57	-		58	-
59	-		60	-
61	-		62	-
63	-		64	-
65	-		66	-
67	-		68	-
69	-		70	-
71	-		72	-
73	-		74	-
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81	-		82	-

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97	-	98	-
99	-	100	-
101	-	102	-
103	-	104	-
105	-	106	-
107	-	108	-
109	-	110	-
111	-	112	-
113	-	114	-
115	-	116	-
117	-	118	-
119	-	120	-

Chapter 8 Appendix C: PiggyBoard connector CN3

Pin	Function		Pin	Function
1	PWM00		2	PWM01
3	PWM02		4	PWM03
5	PWM04		6	PWM05
7	PWM06		8	PWM07
9	PWM08		10	PWM09
11	PWM10		12	PWM11
13	PWM12		14	PWM13
15	PWM14		16	PWM15
17	PWM16		18	PWM17
19	PWM18		20	PWM19
21	PWM20		22	PWM21
23	PWM22		24	PWM23
25	PWM24		26	PWM25
27	PWM26		28	PWM27
29	PWM28		30	PWM29
31	PWM30		32	PWM31
33	PWM32		34	PWM33
35	PWM34		36	PWM35
37	PWM36		38	PWM37
39	PWM38		40	PWM39
41	PWM40		42	PWM41
43	PWM42		44	PWM43
45	PWM44		46	PWM45
47	PWM46		48	PWM47
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		82	PWMADC01

83	PWMADC02	84	PWMADC03
85	PWMADC04	86	PWMADC05
87	PWMADC06	88	PWMADC07
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	-
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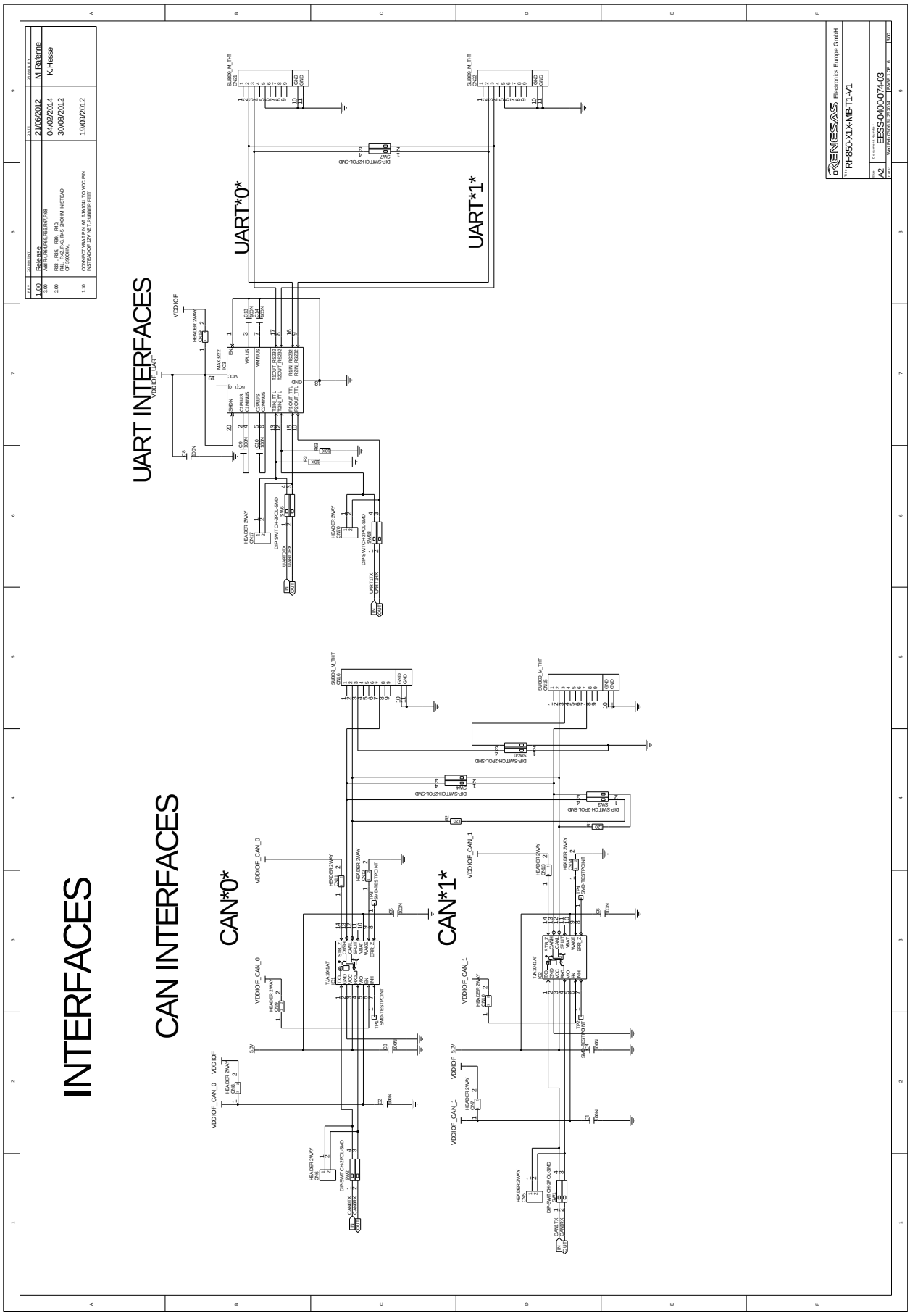
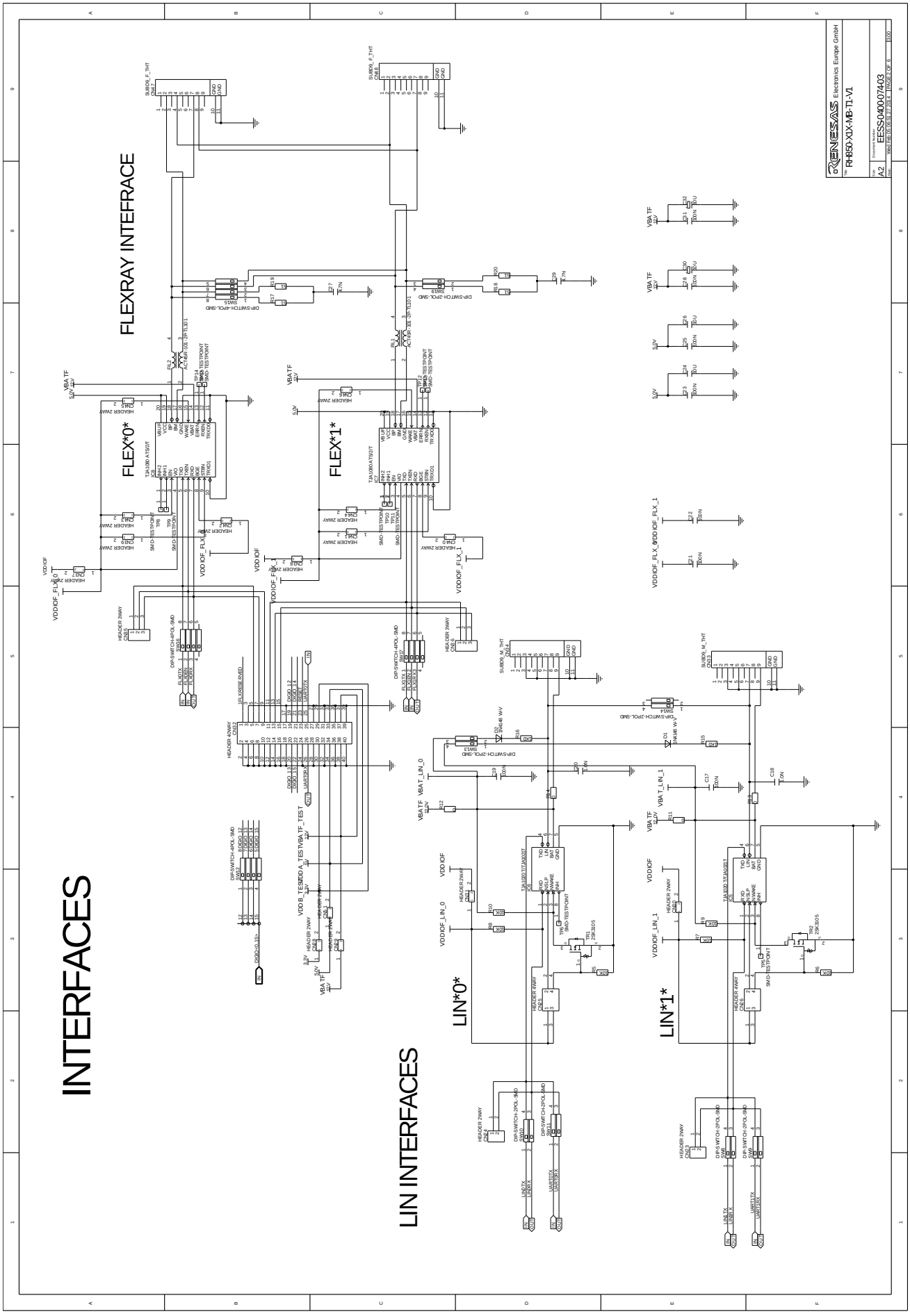
113	-	114	-
115	-	116	-
117	-	118	-
119	-	120	-

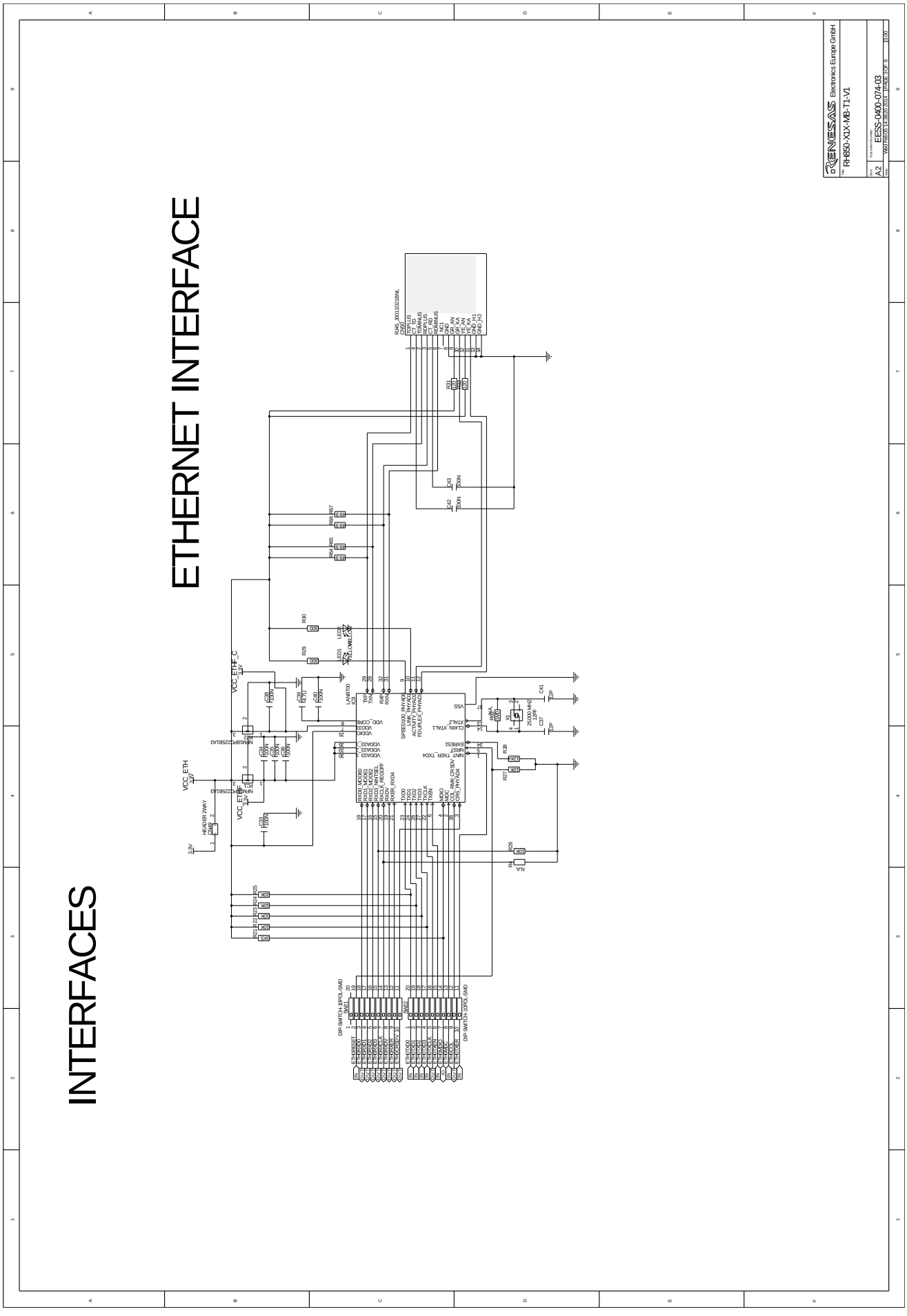
Chapter 9 Appendix D: Schematic

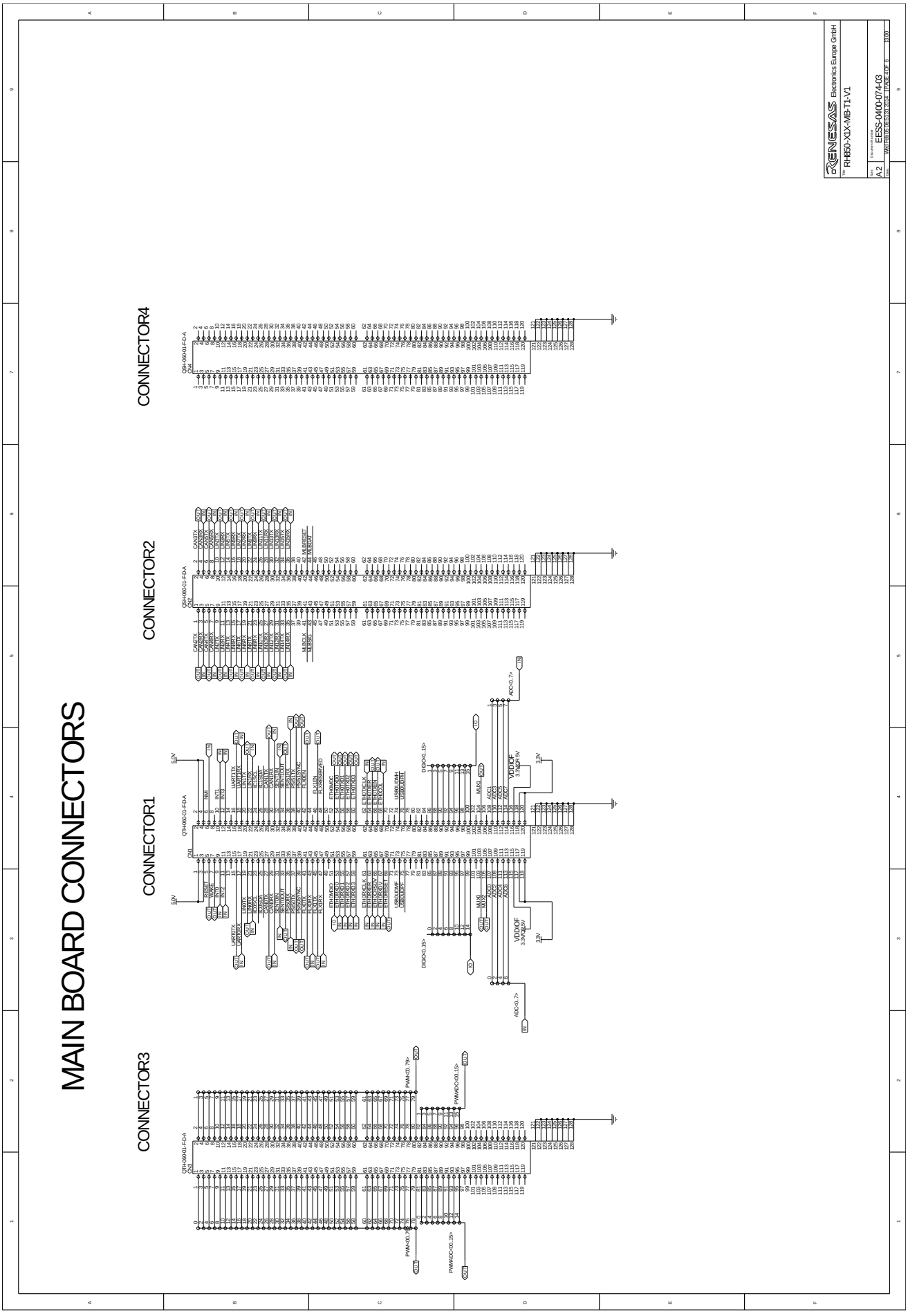


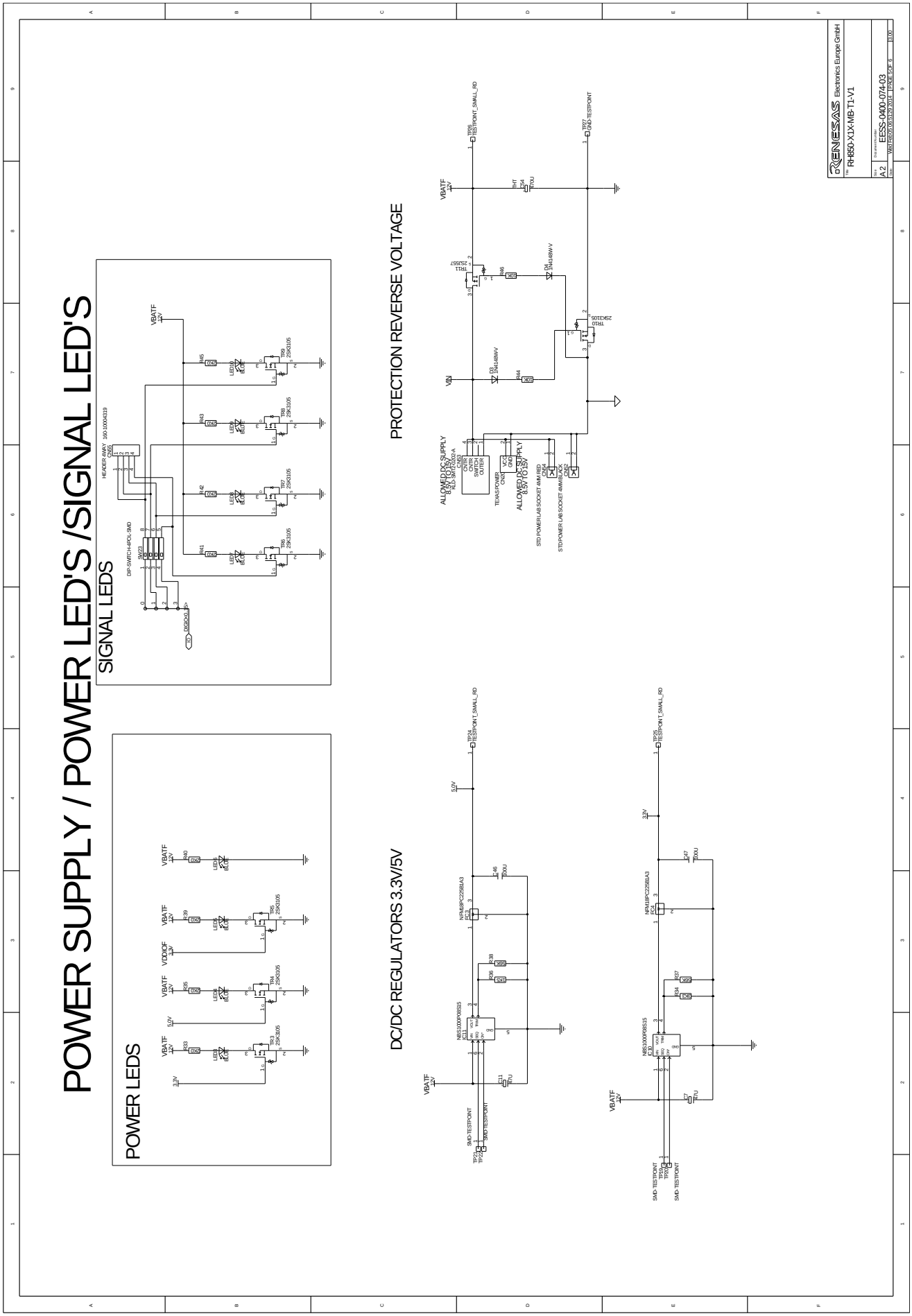

INTERFACES
FLEXRAY INTEFRACE
FLEX*0*
FLEX*1*
LIN INTERFACES
LIN*0*
LIN*1*
RENESAS Electronics Europe GmbH
RH850-X1X-MB-T1-V1
FESS0400007403

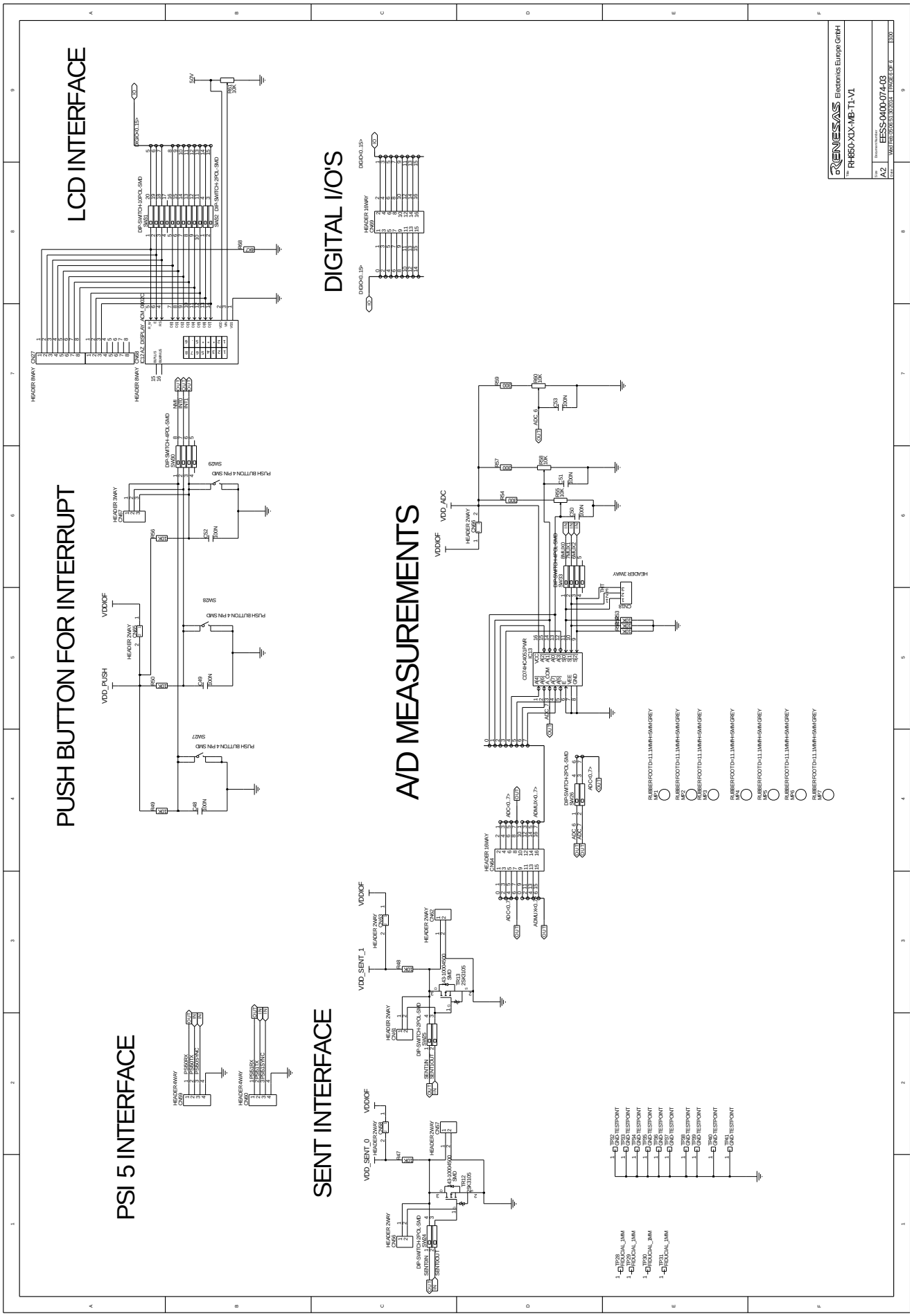
INTERFACES

ETHERNET INTERFACE




MAIN BOARD CONNECTORS
CONNECTOR4
CONNECTOR2
CONNECTOR1
CONNECTOR3
RENESAS Electronics Europe GmbH
RH850-X1X-MB-T1-V1
EESS-0400-07403
A2
Wed Feb 28 08:31:30 2018
PAGE 4 OF 6
3.00


POWER SUPPLY / POWER LED'S /SIGNAL LED'S
SIGNAL LEDS
POWER LEDS
PROTECTION REVERSE VOLTAGE
DC/DC REGULATORS 3.3V/5V
RENESAS Electronics Europe GmbH
RH850-X1X-MB-T1-V1
EESS-0400-074-03
A2


LCD INTERFACE
DIGITAL I/O'S
PUSH BUTTON FOR INTERRUPT
A/D MEASUREMENTS
PSI 5 INTERFACE
SENT INTERFACE
RENESAS Electronics Europe GmbH
RH850-X1X-MB-T1-V1
EESS-0400-074-03

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