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User's Manual

Renesas Starter Kit for SH7201

User's Manual

RENESAS SINGLE-CHIP MICROCOMPUTER
SuperH™RISC engine

Renesas Electronics
www.renesas.com

Rev.2.00 2008.03

Table of Contents

Chapter 1. Preface

Cautions

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Glossary

ADC	Analog to Digital Converter	USB	Universal Serial Bus
CPU	Central Processing Unit	DAC	Digital to Analog Converter
DMA	Direct Memory Access	E10A	“E10A for Starter Kit” debugger
FDT	Flash Development Tool	RSK	Renesas Starter Kit
LED	Light Emitting Diode	LCD	Liquid Crystal Display

Chapter 2. Purpose

This RSK is an evaluation tool for Renesas microcontrollers.

Features include:

- Renesas Microcontroller Programming.
- User Code Debugging.
- User Circuitry such as switches, LEDs and potentiometer(s).
- Sample Application.
- Sample peripheral device initialisation code.

The CPU board contains all the circuitry required for microcontroller operation.

This manual describes the technical details of the RSK hardware. The Quick Start Guide and Tutorial Manual provide details of the software installation and debugging environment.

Chapter 3. Power Supply

3.1. Requirements

This CPU board operates from a 5V power supply.

A diode provides reverse polarity protection only if a current limiting power supply is used.

All CPU boards are supplied with an E10A debug module and a PSU. When the CPU board is connected to another system that system should supply power to the CPU board.

All CPU boards have an optional centre positive supply connector using a 2.0mm barrel power jack.

Warning

The CPU board is neither under not over voltage protected. Use a centre positive supply for this board. Weher possible use the supplied PSU.

3.2. Power – Up Behaviour

When the RSK is purchased the CPU board has the ‘Release’ or stand alone code from the example tutorial code pre-programmed into the Renesas microcontroller. On powering up the board the user LEDs will start to flash. Pressing any switch will cause the LEDs to flash at a rate controlled by the potentiometer.

Chapter 4. Board Layout

4.1. Component Layout

The following diagram shows top layer component layout of the board.

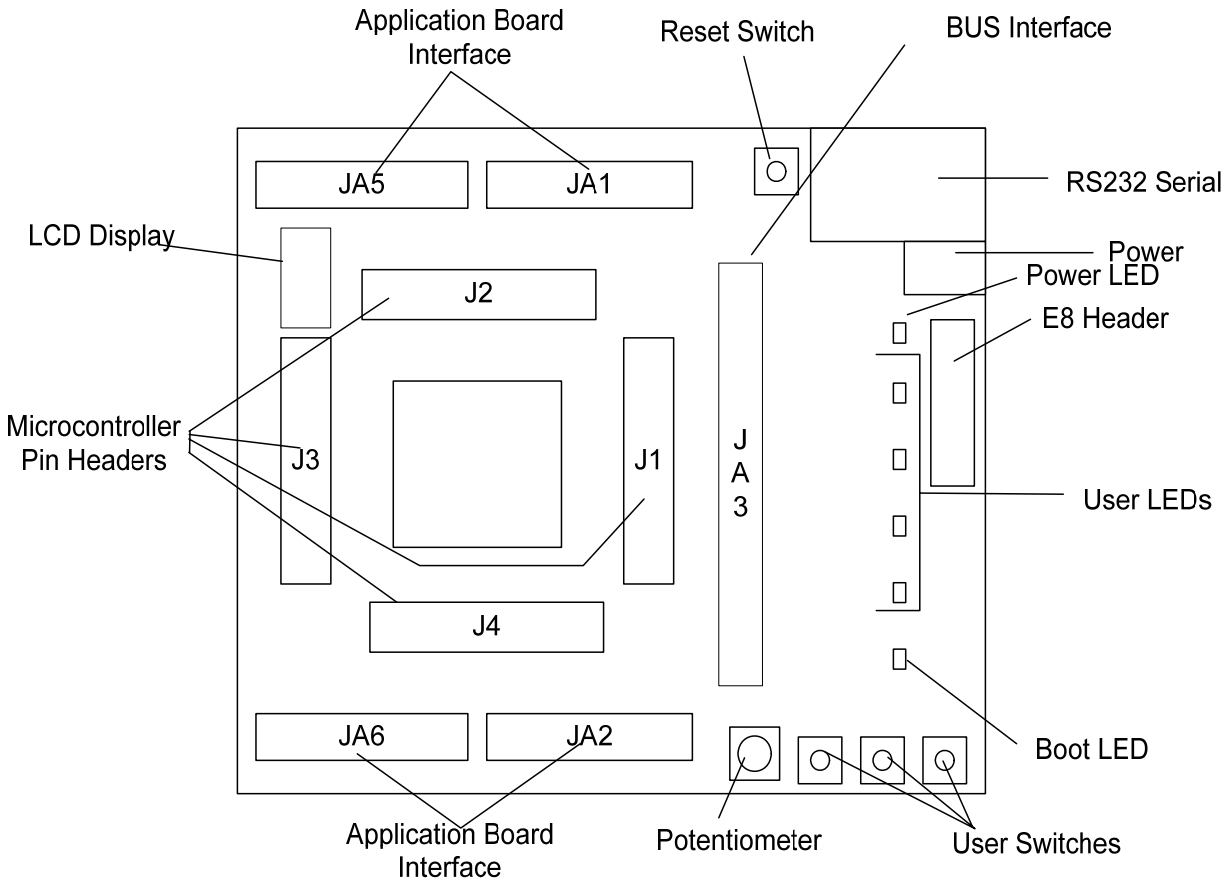

Figure 4-1: Board Layout

4.2.Board Dimensions

The following diagram gives the board dimensions and connector positions. All through hole connectors are on a common 0.1" grid for easy interfacing.

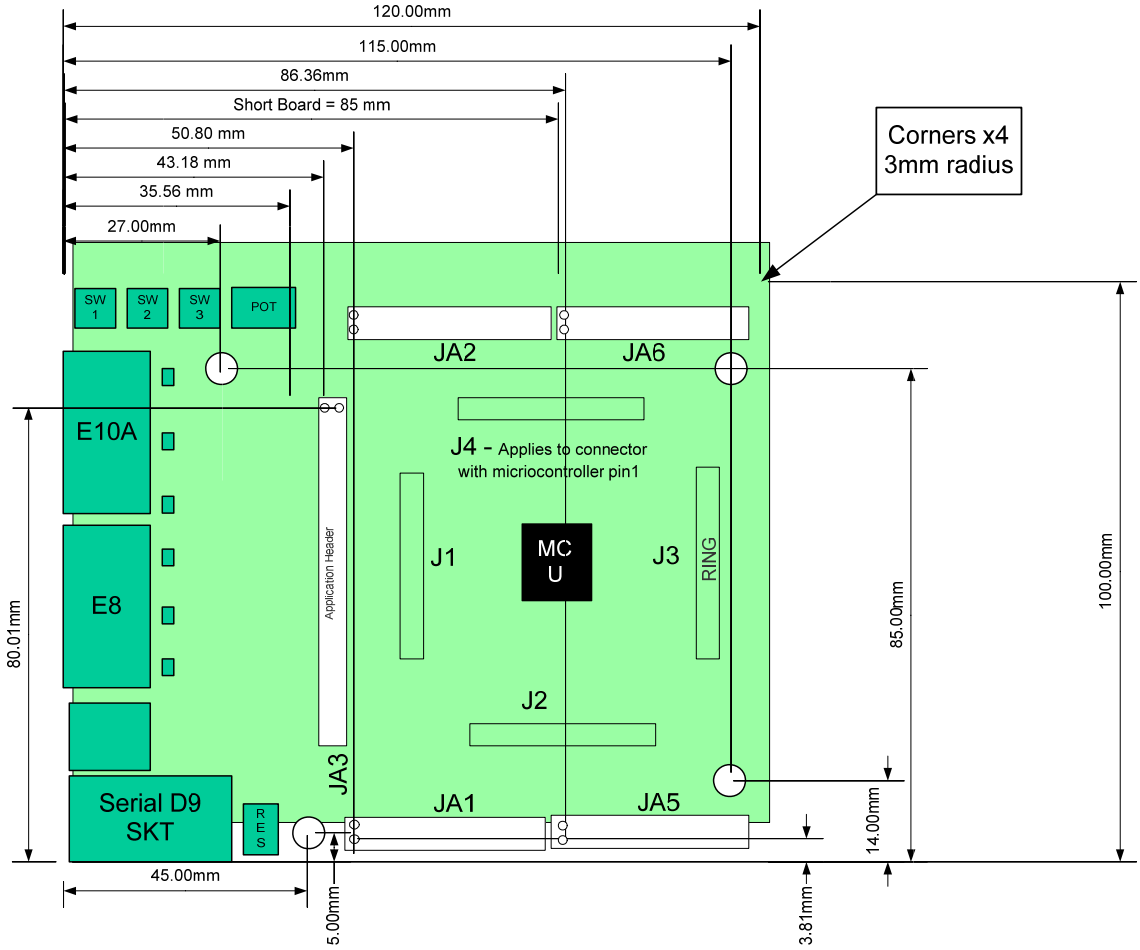

Figure 4-2 : Board Dimensions

Chapter 5. Block Diagram

Figure 5-5-1 shows the CPU board components and their connectivity.

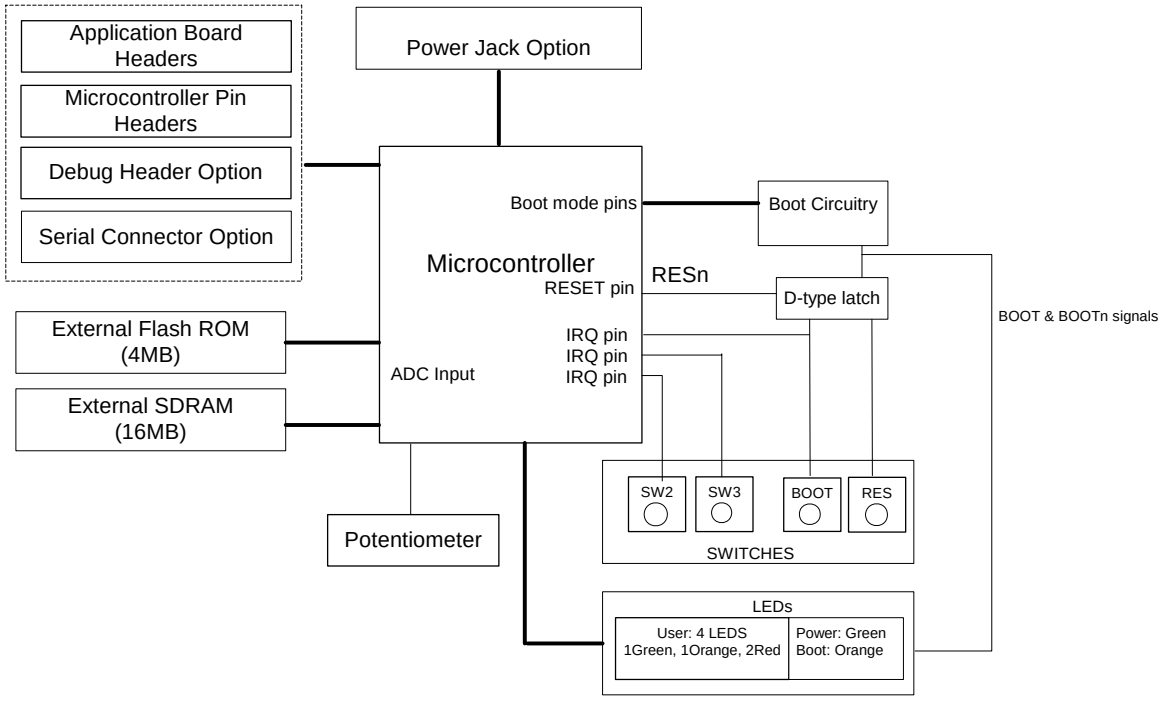

Figure 5-5-1: Block Diagram

Figure 5-5-2 shows the connections to the RSK.

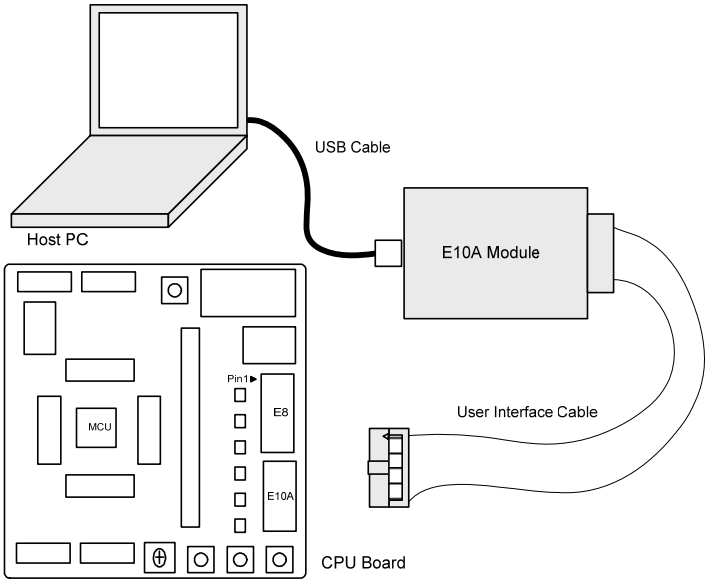

Figure 5-5-2 : RSK Connections

Chapter 6. User Circuitry

6.1. Switches

There are four switches located on the CPU board. The function of each switch and its connection are shown in Table 6-1.

Switch	Function	Microcontroller
RES	When pressed; the CPU board microcontroller is reset.	RESn, Pin 2
SW1/BOOT*	Connects to an IRQ input for user controls. The switch is also used in conjunction with the RES switch to place the device in BOOT mode.	IRQ0, Pin 59 (Port C, bit 22)
SW2*	Connects to an IRQ line for user controls.	IRQ1 , Pin 58 (Port C, bit 23)
SW3*	Connects to an IRQ line for user controls. Also connects to the ADC trigger input. The option is a pair of 0R links. For more details on option links, please refer to Sec 6.6.	IRQ2, Pin 57 (Port C, bit 24)

Table 6-1: Switch Functions

*Refer to schematic for detailed connectivity information.

6.2. LEDs

There are six LEDs on the CPU board. The green 'POWER' LED lights when the board is powered. The orange BOOT LED indicates the device is in BOOT mode when lit. The four user LEDs are connected to an IO port and will light when their corresponding port pin is set low.

Table 6-2, below, shows the LED pin references and their corresponding microcontroller port pin connections.

LED Reference (As shown on silkscreen)	Microcontroller Port Pin function	Microcontroller Pin Number	Polarity
LED0	Port D bit 13	108	Active Low
LED1	Port C bit 13	68	Active Low
LED2	Port C bit 20	61	Active Low
LED3	Port C bit 21	60	Active Low

Table 6-2: LED Port

6.3. Potentiometer

A single turn potentiometer is connected to AN0 of the microcontroller. This may be used to vary the input analog voltage value to this pin between AVCC and Ground.

6.4. Serial port

The microcontroller programming serial port (SCIF5) is connected to the E8 connector. This serial port can optionally be connected to the RS232 transceiver by fitting option resistors and the D connector in position J7. The connections to be fitted are listed in the following table.

Description	Function	Fit for RS232	Remove for E8a	Fit for Rs232	Remove for RS232
TxD5	Programming Serial Port	R90	R71	R71	R90
RxD5	Programming Serial Port	R92	R77	R77	R92

Table 6-3: Serial Options Links

The board is designed to accept a straight through RS232 cable.

6.5. LCD Module

The LCD module supplied with the RSK can be connected to the connector J6 for use with the tutorial code. Any module that conforms to the pin connections and has a KS0066u compatible controller can be used. The LCD module uses a 4bit interface to reduce the pin allocation. No contrast control is provided; this must be set on the display module.

Table 6-4 shows the pin allocation and signal names used on this connector.

The module supplied with the CPU board only supports 5V operation.

J13					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	Ground	-	2	5V Only	-
3	No Connection	-	4	DLCDRS	70
5	R/W (Wired to Write only)	-	6	DLCDE	69
7	No Connection	-	8	No connection	-
9	No Connection	-	10	No connection	-
11	DLCD4	121	12	DLCD5	120
13	DLCD6	119	14	DLCD7	118

Table 6-4 LCD Module Connections

6.6. Option Links

Table 6-5 below describes the function of the option links contained on this CPU board. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R7	FLASH memory	Write protects Flash Memory	Does not write protect Flash Memory	
R8	A-D/D-A	Connects microcontroller pin 92 to AN6	**Disconnects microcontroller pin 92 from AN6**	R9
R9	A-D/D-A	**Connects microcontroller pin 92 to DA0**	Disconnects microcontroller pin 92 from DA0	R8
R10	A-D/D-A	**Connects microcontroller pin 93 to DA1**	Disconnects microcontroller pin 93 from DA1	R11
R11	A-D/D-A	Connects microcontroller pin 93 to AN7	**Disconnects microcontroller pin 93 from AN7**	R10
R16	Operating mode	Connects MD1 = 0	**Does not connect MD1 = 0**	R15
R17	Operating mode	Connects MD0 = 1	**Does not connect MD0 = 1**	R18
R18	Operating mode	**Connects MD0 = 0**	Does not connect MD0 = 0	R17
R19	Potentiometer	**Connects potentiometer to microcontroller pin 86**	Disconnects potentiometer from microcontroller pin 86	R21
R20	SDRAM chip select	**Enables SDRAM Chip Select**	Disables SDRAM Chip Select	
R21	Analog Input	Connects microcontroller pin 86 to AN0	**Disconnects microcontroller pin 86 from AN0**	R19
R23	Chip Select	Connects microcontroller pin 81 to CS2n	**Disconnects microcontroller pin 81 from CS2n**	R25
R24	FLASH chip select	**Enables FLASH Chip Select**	Disables FLASH Chip Select	
R25	ADTRGn	**Connects microcontroller pin 81 to ADTRGn**	Disconnects microcontroller pin 81 from ADTRGn	R23, R59
R26	Transceiver	**Enables read from Expansion Connector**	Disables read from Expansion Connector	
R28	Motor Control	Connects microcontroller pin 80 to TRISTn	**Disconnects microcontroller pin 80 from TRISTn**	R29
R29	Chip Select	**Connects microcontroller pin 80 to CS3n**	Disconnects microcontroller pin 80 from CS3n	R28
R30	Write Signal	Connects microcontroller pin 72 to WRn	**Disconnects microcontroller pin 72 from WRn**	R33
R31	CAN	**Connects microcontroller pin 170 to CAN1_STBn**	Disconnects microcontroller pin 170 from CAN1_STBn	R32, R127

R32	Motor	Connects microcontroller pin 170 to UD	Disconnects microcontroller pin 170 from UD	R31
R33	Write Signal	Connects microcontroller pin 72 to WR0n	Disconnects microcontroller pin 72 from WR0n	R30
R34	Operating mode	Connects MD_CLK1 = 1	Does not connect MD_CLK1 = 1	R36
R35	Operating mode	Connects MD_CLK0 = 1	Does not connect MD_CLK0 = 1	R37
R36	Operating mode	Connects MD_CLK1= 0	Does not connect MD_CLK1 = 0	R34
R37	Operating mode	Connects MD_CLK0= 0	Does not connect MD_CLK0 = 0	R35
R39	Power supply	Connects AVREF to CON_VREF	Disconnects AVREF from CON_VREF	R72
R44	Oscillator X1	Connects external clock source to microcontroller via CON_EXTAL	Disconnects external clock source from microcontroller	R47
R45	Oscillator X1	Feedback resistor across X1	No feedback	-
R46	Oscillator X1	Connects X1 to microcontroller	Disconnects X1 from microcontroller	-
R47	Oscillator X1	Connects external clock source to microcontroller via CON_XTAL	Disconnects external clock source from microcontroller	R44
R48	Oscillator X2	Connects external clock source to microcontroller via CON_RTC_X1	Disconnects external clock source from microcontroller	R50
R49	Oscillator X2	Connects X2 to microcontroller	Disconnects X2 from microcontroller	R51
R50	Oscillator X2	Connects external clock source to microcontroller via CON_RTC_X2	Disconnects external clock source from microcontroller	R48
R51	Oscillator X2	Connects X2 to microcontroller	Disconnects X2 from microcontroller	R49
R52	Oscillator X2	Feedback resistor across X2	No feedback	-
R54	Serial port	Connects RXD1 to J10	Disconnects RXD1 from J10	R55
R55	Serial port	Connects TXD1 to J10	Disconnects TXD1 from J10	R54
R56	Power supply	Connects AVCC to Board_VCC	Disconnects AVCC from Board_VCC	R57, R72
R57	Power supply	Connects AVCC to CON_AVCC	Disconnects AVCC from CON_AVCC	R56
R59	Switches	Connects SW3 to ADTRGn	Disconnects SW3 from ADTRGn	R25, R63
R60	Serial port	Connects RS323TX to U9	Disconnects RS232TX from U9	R66, R71,
R62	Power supply	Connects GROUND to AVSS	Disconnects GROUND from AVSS	-
R63	Switches	Connects SW3 to IRQ2n	Disconnects SW3 from IRQ2n	R59
R64	Serial port	Connects TxD1 to U9	Disconnects TxD1 from U9	R81
R66	Serial port	Connects TxD0 to U9	Disconnects TxD0 from U9	R60, R71, R90, R92
R68	Power supply	Connects UC_VCC to Board_VCC	Disconnects UC_VCC from Board_VCC	R80, R83
R69	Power Supply	Connects CON_5V to Supply regulator input	Disconnects CON_5V from Supply regulator input	R102
R70	Serial port	Connects RS232RX to U9	Disconnects RS323RX from U9	R73, R77, R92

R71	Serial port	Connects serial port PTTX to RS232 Serial	Disconnects serial port PTTX from RS232 Serial	R60, R66, R90
R72	Power supply	Connects VREF to Board_VCC	Disconnects VREF from Board_VCC	R56, R39
R73	Serial port	Connects RS232 Serial to RxD0	Disconnects RS232 Serial from RxD0	R70, R77, R92
R76	Power supply	Connects LCD power to internal 5V	Disconnects LCD power from internal 5V	R102
R77	Serial port	Connects serial port PTRX to RS232 Serial	Disconnects serial port PTRX from RS232 Serial	R70, R73, R92
R78	Serial port	Shuts down RS232 transceiver	Enables RS232 transceiver	R82
R80	Power supply	Connects Board_VCC to CON_3V3	Disconnects Board_VCC from CON_3V3	R68, R83
R81	Serial port	Connects RxD1 to U9	Disconnects RxD1 from U9	R64
R82	Serial port	Enables RS232 transceiver	Shuts down RS232 transceiver	R78
R83	Power supply	Connects 3.3V supply from U8 to Board_VCC	Disconnects 3.3V supply from U8	R68, R80
R90	E8 connector	Connects PTTX to E8_TXD on E8 connector	Disconnects PTTX from E8_TXD	R60, R71
R92	E8 connector	Connects PTRX to E8_RXD on E8 connector	Disconnects PTRX from E8_RXD	R70, R77
R102	Power Supply	Connects J11 to Board_VCC	J11 disconnected from Board_VCC	-
R104	CAN transceiver 0	Connects CAN0_EN to CAN transceiver 0	Disconnects CAN0_EN from CAN transceiver	R105
R106	CAN transceiver 0	Connects CRx0 to CAN transceiver 0	Disconnects CRx0 from CAN transceiver	-
R107	CAN transceiver 0	Connects 5V to CAN transceiver 0 VBAT	Disconnects 5V from CAN transceiver	-
R108	CAN transceiver 0	Connects CTx0 to CAN transceiver 0	Disconnects CTx0 from CAN transceiver	-
R109	CAN transceiver 1	Connects CAN1_EN to CAN transceiver 1	Disconnects CAN1_EN from CAN transceiver	R110
R111	CAN transceiver 1	Connects CRx1 to CAN transceiver 1	Disconnects CRx1 from CAN transceiver	-
R112	CAN transceiver 1	Connects CTx1 to CAN transceiver 1	Disconnects CTx1 from CAN transceiver	-
R118	CAN transceiver 1	Connects 5V to CAN transceiver 1 VBAT	Disconnects 5V from CAN transceiver	-
R120	CAN transceiver 1	Connects CAN0_ERRn to microcontroller pin 173	Disconnects CAN0_ERRn from microcontroller pin 173	-

R123	CAN transceiver 0	Connects CAN0_STBn to microcontroller pin 166	Disconnects CAN0_STBn from microcontroller pin 166	-
R124	CAN transceiver 0	Connects CAN1_ERRn to microcontroller pin 174	Disconnects CAN1_ERRn from microcontroller pin 174	-
R127	CAN transceiver 0	Connects CAN1_STBn to R31	Disconnects CAN0_STBn from R31	R31
R130	Power supply	Connects E8_VCC to the regulator input	Disconnects E8_VCC from the regulator input	R102
R134	Interrupt	Connects BUSYn from FLASH memory chip U3 to microcontroller IRQ3n	Disconnects BUSYn from FLASH memory chip U3 from microcontroller IRQ3n	-

Table 6-5 Option Links

6.7. Oscillator Sources

A crystal oscillator is fitted on the CPU board and used to supply the main clock input to the Renesas microcontroller. Table 6- details the oscillators that are fitted and alternative footprints provided on this CPU board:

Component		
Crystal (X1)	Fitted	10MHz (HC49/4H package)
Crystal (X2)	Fitted	32.768kHz (90SMX package)

Table 6-6: Oscillators / Resonators

Warning: When replacing the default oscillator with that of another frequency, the debugging monitor will not function unless the following are corrected:

- FDT programming kernels supplied are rebuilt for the new frequency

6.8. Reset Circuit

The CPU Board includes a simple latch circuit that links the mode selection and reset circuit. This circuit is not required on customers' boards as it is intended for providing easy evaluation of the operating modes of the device on the RSK. Please refer to the hardware manual for more information on the requirements of the reset circuit.

The reset circuit operates by latching the state of the boot switch (SW1) on pressing the reset button. This control is subsequently used to modify a port pin state to select which code is executed.

The reset is held in the active state for a fixed period by a pair of resistors and a capacitor. Please check the reset requirements carefully to ensure the reset circuit on the user's board meets all the reset timing requirements.

Chapter 7. Programming Methods

The board is intended for use with HEW and the supplied E10A debugger only. Please refer to the datasheet of the Flash memory used on this RSK to learn programming methods of the Flash programming.

Chapter 8.Headers

8.1. Microcontroller Headers

Table 8-1 to Table 8-4 show the microcontroller pin headers and their corresponding microcontroller connections. The header pins connect directly to the microcontroller pin unless otherwise stated.

* marks pins where a the link to the microcontroller pin is open circuit due to unfitted link (link ID in brackets)

J1					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	GND	-	23	A(5)	23
2	RESn	2	24	A(6)	24
3	UC_VCC	-	25	A(7)	25
4	NMI	4	26	A(8)	26
5	GND	-	27	A(9)	27
6	CON_RTC_X1*	7	28	A(10)	28
7	CON_RTC_X2*	6	29	A(11)	29
8	GND	-	30	A(12)	30
9	CON_XTAL*	9	31	A(13)	31
10	COM_EXTAL*	10	32	A(14)	32
11	GND	-	33	A(15)	33
12	CKIO*	12	34	A(16)	34
13	UC_VCC	-	35	A(17)	35
14	MD_CLK0	14	36	A(18)	36
15	MD_CLK1	15	37	A(19)	37
16	GND	-	38	GND	-
17	A(0)	17	39	A(20)	39
18	UC_VCC	-	40	UC_VCC	-
19	A(1)	19	41	A(21)	41
20	A(2)	20	42	A(22)	42
21	A(3)	21	43	A(23)	43
22	A(4)	22	44	Not connected	-

Table 8-1: J1 microcontroller header

J2					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	GND	-	23	SDCKE	67
2	DREQ3	46	24	LED1	68
3	DACK3	47	25	DLCDE	69
4	DACT3	48	26	DLCDRS	70
5	DTEND3	49	27	WR1n	71
6	CTx0	50	28	WR0n_WRn	72
7	CRx0	51	29	RDn	73
8	CTx1	52	30	GND	-
9	UC_VCC	-	31	SDCS0n	75
10	CRx1	54	32	UC_VCC	-
11	GND	-	33	PTCK	77
12	IRQ3n	56	34	PTRX	78
13	IRQ2n	57	35	PTTX	79
14	IRQ1n	58	36	CS3n_TRISTn	80
15	IRQ0n	59	37	CS2n_ADTRGn	81
16	LED3	60	38	CS1n	82
17	LED2	61	39	CS0n	83
18	DQM1	62	40	AVCC	-
19	DQM0	63	41	VREF	-
20	SDWEn	64	42	ADPOT_AN0	86
21	SDCASn	65	43	AN1	87
22	SDRASn	66	44	AN2	88

Table 8-2: J2 microcontroller header

J3					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	AN3	89	23	TxD1	111
2	AN4	90	24	SCK0	112
3	AN5	91	25	RxD0	113
4	AN6_DA0	92	26	TxD0	114
5	AN7_DA1	93	27	SCK4	115
6	AVSS	-	28	RxD4	116
7	IO0	95	29	TxD4	117
8	IO1	96	30	DLCD7	118
9	IO2	97	31	DLCD6	119
10	IO3	98	32	DLCD5	120
11	IO4	99	33	DLCD4	121
12	IO5	100	34	GND	-
13	UC_VCC	-	35	PIN123	123
14	IO6	102	36	PIN124	124
15	GND	-	37	GND	-
16	IO7	104	38	UDTRSTn	126
17	SCL2	105	39	UC_VCC	-
18	SDA2	106	40	UDTMS	128
19	LED0	108	41	UDTDO	129
20	BOOTn	107	42	UDTDI	130
21	SCK1	109	43	UDTCK	131
22	RxD1	110	44	ASEBRKn	132

Table 8-3: J3 microcontroller header

J4					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	ASEMDn	133	23	GND	-
2	MD1	134	24	TIOC3A	154
3	MD0	135	25	UC_VCC	-
4	WDT_OVFn	136	26	Up	158
5	GND	-	27	TIOC3C	159
6	D(0)	138	28	Un	160
7	UC_VCC	-	29	Vp	161
8	D(1	140	30	Wp	162
9	D(2)	141	31	Vn	163
10	D(3)	142	32	Wn	164
11	D(4)	143	33	CAN0_EN	165
12	D(5)	144	34	CAN0_STBn	166
13	D(6)	145	35	UC_VCC	-
14	D(7)	146	36	CAN1_EN	168
15	D(8)	147	37	GND	-
16	D(9)	148	38	UD_CAN1_STBn	170
17	D(10)	149	39	TMO0	171
18	D(11)	150	40	TMRI0	172
19	D(12)	151	41	CAN1_ERRn*	174
20	D(13)	152	42	CAN0_ERRn*	173
21	D(14)	153	43	UC_VCC	-
22	D(15)	154	44	MRESn	176

Table 8-4: J4 microcontroller header

8.2.Application Headers

Table 8-5 and Table 8-6 below show the standard application header connections.

Note: Asterisk indications apply to all tables in this section

* marks pins where a the link to the microcontroller pin is via a 100R resistor and to BOARD VCC via a 4k7 resistor (100R ID & 4k7 ID)

** marks pins where a the link to the microcontroller pin is open circuit due to unfitted link (link ID in brackets)

*** marks pins where a the link to the microcontroller pin is via a fitted 0R link (link ID in brackets)

JA1							
Pin	Header Name	CPU board Signal Name	Device Pin	Pin	Header Name	CPU board Signal Name	Device Pin
1	5V	CON_5V	-	14	DAC1	DA1	93*** (R10)
2	0V(5V)	GROUND	-	15	IO_0	IO0	95
3	3V3	CON_3V3	-	16	IO_1	IO1	96
4	0V(3V3)	GROUND	-	17	IO_2	IO2	97
5	AVcc	CON_AVCC	84** (R57)	18	IO_3	IO3	98
6	AVss	AVSS	94	19	IO_4	IO4	99
7	AVref	CON_VREF	85** (R39)	20	IO_5	IO5	100
8	ADTRG	ADTRGn	57** (R59)	21	IO_6	IO6	101
9	AD0	AN0	86** (R21)	22	IO_7	IO7	102
10	AD1	AN1	87	23	IRQ3	IRQ3n	56
11	AD2	AN2	88	24	IIC_EX	-	-
12	AD3	AN3	89	25	IIC_SDA	SDA2	106* (R13 & R4)
13	DAC0	DA0	92*** (R9)	26	IIC_SCL	SCL2	105* (R12 & R3)

Table 8-5: JA1 Standard Generic Header

JA2							
Pin	Header Name	CPU board Signal Name	Device Pin	Pin	Header Name	CPU board Signal Name	Device Pin
1	RESn	RESn	2	14	Un	Un	160
2	EXTAL	CON_EXTAL	10** (R44)	15	Vp	Vp	161
3	NMIn	NMI	4	16	Vn	Vn	163
4	Vss1	GROUND	-	17	Wp	Wp	162
5	WDT_OVF	WDT_OVFn	136	18	Wn	Wn	164
6	SCIaTX	TxD0	114	19	TMR0	TMO0	171
7	IRQ0	IRQ0n	59	20	TMR1	TIOC3A	156
8	SCIaRX	RXD0	113	21	TRIGa	TMRI0	172
9	IRQ1	IRQ1n	58	22	TRIGb	TIOC3C	159
10	SCIaCK	SCK0	112	23	IRQ2	IRQ2n	57
11	UD	UD	170** (R32)	24	TRISTn	TRISTn	80** (R28)
12	CTSRTS	-	-	25	Reserved		
13	Up	Up	158	26	Reserved		

Table 8-6: JA2 Standard Generic Header

JA3							
Pin	Header Name	CPU board Signal Name	Device Pin	Pin	Header Name	CPU board Signal Name	Device Pin
1	BA(0)	BA(0)	-	26	BWRn	BWRn	-
2	BA(1)	BA(1)	-	27	BCS1n	BCS1n	-
3	BA(2)	BA(2)	-	28	BCS2n	BCS2n	-
4	BA(3)	BA(3)	-	29	BD(8)	BD(8)	-
5	BA(4)	BA(4)	-	30	BD(9)	BD(9)	-
6	BA(5)	BA(5)	-	31	BD(10)	BD(10)	-
7	BA(6)	BA(6)	-	32	BD(11)	BD(11)	-
8	BA(7)	BA(7)	-	33	BD(12)	BD(12)	-
9	BA(8)	BA(8)	-	34	BD(13)	BD(13)	-
10	BA(9)	BA(9)	-	35	BD(14)	BD(14)	-
11	BA(10)	BA(10)	-	36	BD(15)	BD(15)	-
12	BA(11)	BA(11)	-	37	BD(16)	BD(16)	-
13	BA(12)	BA(12)	-	38	BD(17)	BD(17)	-
14	BA(13)	BA(13)	-	39	BD(18)	BD(18)	-
15	BA(14)	BA(14)	-	40	BD(19)	BD(19)	-
16	BA(15)	BA(15)	-	41	BD(20)	BD(20)	-
17	BD(0)	BD(0)	-	42	BD(21)	BD(21)	-
18	BD(1)	BD(1)	-	43	BD(22)	BD(22)	-
19	BD(2)	BD(2)	-	44	BSDCLK	BSDCLK	-
20	BD(3)	BD(3)	-	45	BCS3n	BCS3n	-
21	BD(4)	BD(4)	-	46	Bus Control	---	-
22	BD(5)	BD(5)	-	47	BWR1n	BWR1n	-
23	BD(6)	BD(6)	-	48	BWR0n	BWR0n	-
24	BD(7)	BD(7)	-	49	Data Bus Strobe	---	-
25	BRDn	BRDn	-	50	Reserved	---	-

Table 8-7: JA3 Standard Generic Header

JA5							
Pin	Header Name	CPU board Signal Name	Device Pin	Pin	Header Name	CPU board Signal Name	Device Pin
1	AD4	AN4	90	13	Reserved		
2	AD5	AN5	91	14	Reserved		
3	AD6	AN6	92** (R8)	15	Reserved		
4	AD7	AN7	93** (R11)	16	Reserved		
5	CAN1TX	CTx0	50	17	Reserved		
6	CAN1RX	CRx0	51	18	Reserved		
7	CAN2TX	CTx1	52	19	Reserved		
8	CAN2TX	CTx1	54	20	Reserved		
9	Reserved			21	Reserved		
10	Reserved			22	Reserved		
11	Reserved			23	Reserved		
12	Reserved			24	Reserved		

Table 8-8: JA5 Standard Generic Header

JA6							
Pin	Header Name	CPU board Signal Name	Device Pin	Pin	Header Name	CPU board Signal Name	Device Pin
1	DREQ	DREQ3	46	13	Reserved		
2	DACK	DACK3	47	14	Reserved		
3	TEND	DTEND3	49	15	Reserved		
4	STBYn	DACT3	48	16	Reserved		
5	RS232TX	RS232TX	(R60)****	17	Reserved		
6	RS232RX	RS232RX	(R70)****	18	Reserved		
7	SCIbRX	RxD1	110	19	Reserved		
8	SCIbTX	TxD1	111	20	Reserved		
9	SCIcTX	TxD4	117	21	Reserved		
10	SCIbCX	SCK1	109	22	Reserved		
11	SCIcCK	SCK4	115	23	Reserved		
12	SCIcRX	RxD4	116	24	Reserved		

Table 8-9: JA6 Standard Generic Header

**** This signal is only connected to the named link, which is not fitted to the board. For details refer to the RSKSH7201 circuit schematics page 5

Chapter 9. Code Development

9.1. Overview

Note: For all code debugging using Renesas software tools, the CPU board must be connected to a PC USB port via an E10A. An E10A is supplied with the RSK product.

Due to the continuous process of improvements undertaken by Renesas the user is recommended to review the information provided on the Renesas website at www.renesas.com to check for the latest updates to the Compiler and Debugger manuals.

9.2. Compiler Restrictions

The compiler supplied with this RSK is fully functional for a period of 60 days from first use. After the first 60 days of use have expired, the compiler will default to a maximum of 256k code and data. To use the compiler with programs greater than this size you will need to purchase the full tools from your distributor.

9.3.Breakpoint Support

This RSK is supplied with E10A emulator which supports breakpoints in ROM. For more details on breakpoints & E10A functions please refer to '*SuperH Family E10A-USB Emulator User's Manual*'.

9.4.Memory Map

The memory map shown in this section visually describes the locations of the each memory areas when operating the RSK in the default mode.

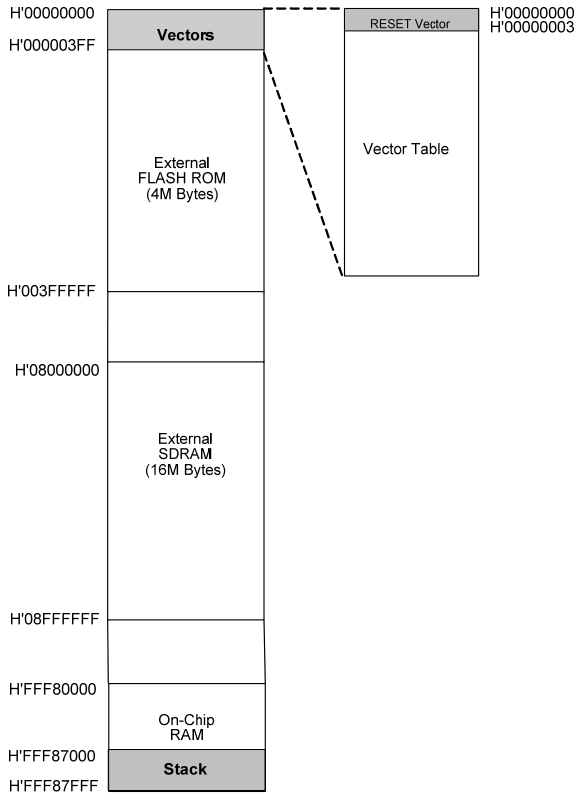

Figure 9-1: Memory Map

Chapter 10. Component Placement

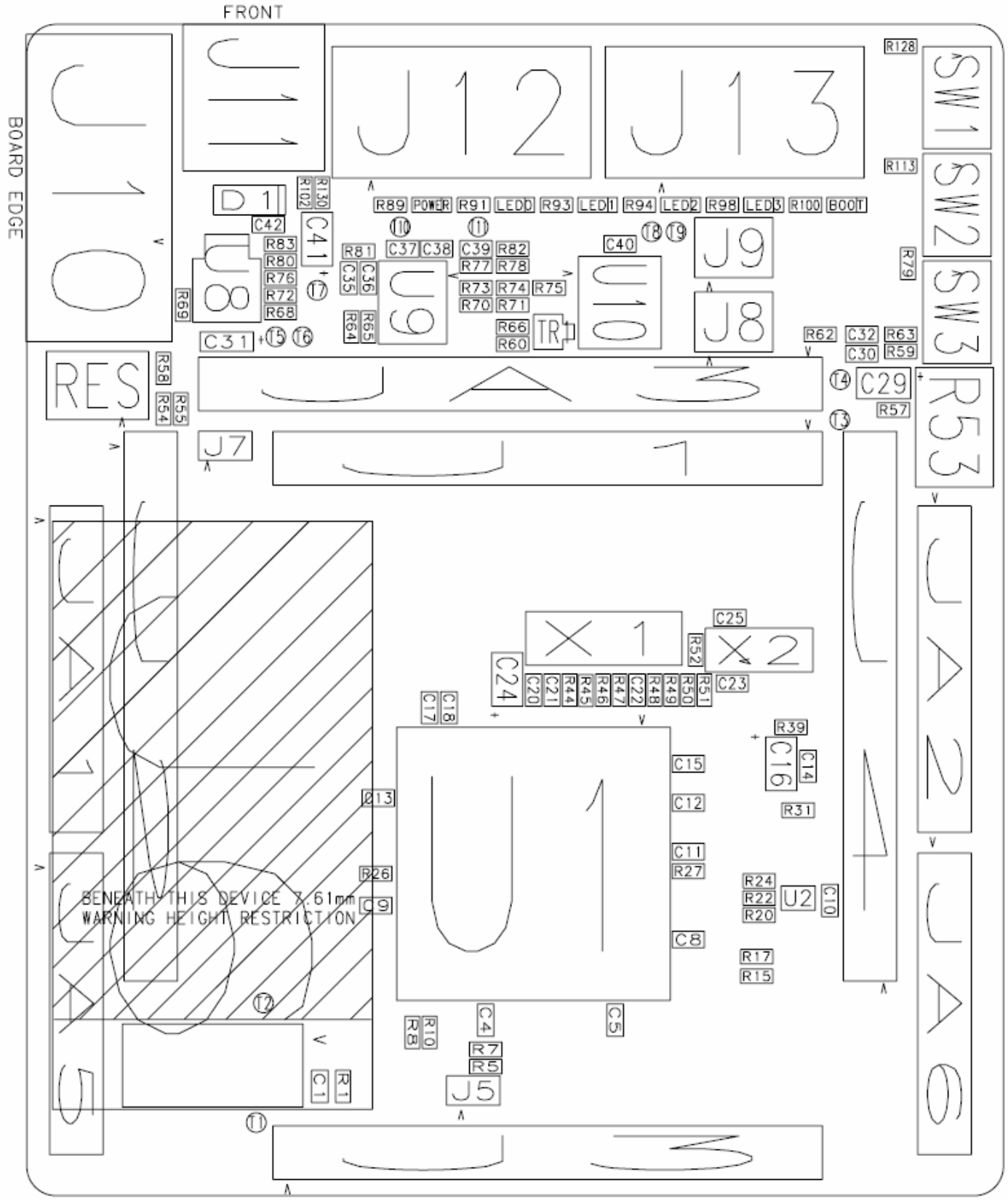

Figure 11-1: Component Placement (Top Layer)

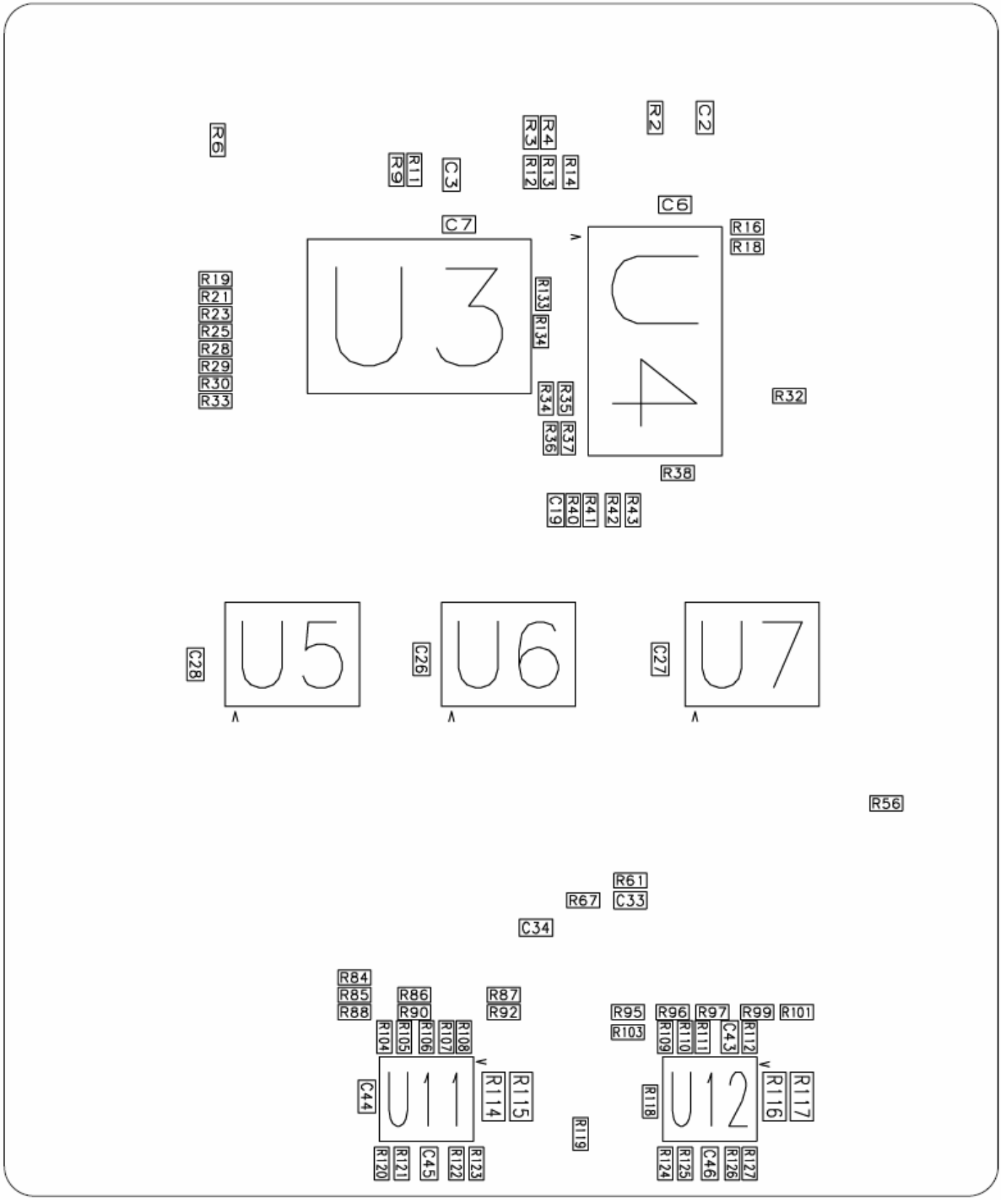

Figure 11-2: Component Placement (Bottom Layer)

Chapter 11. Additional Information

For details on how to use High-performance Embedded Workshop (HEW), refer to the HEW manual available on the CD or installed in the Manual Navigator.

For information about the SH7201 microcontrollers refer to the SH7201 Group *Hardware Manual*

For information about the SH7201 assembly language, refer to the SH *Series Programming Manual*

For information about the E10A Emulator, please refer to the S*H Family E10A-USB Emulator User's Manual.*

Online technical support and information is available at: http://www.renesas.com/renesas_starter_kits

Technical Contact Details

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General information on Renesas Microcontrollers can be found on the Renesas website at: http://www.renesas.com/

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