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User's Manual

Renesas Starter Kit for H8SX/1648

User's Manual

RENESAS SINGLE-CHIP MICROCOMPUTER H8SX FAMILY

Renesas Electronics
www.renesas.com

Rev.1.00 2007.11

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Chapter 1. Preface

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Glossary

CPU	Central Processing Unit	HEW	High-performance Embedded Workshop
LED	Light Emitting Diode	RSK	Renesas Starter Kit
PC	Program Counter	E10A	E10A for Starter Kit Emulator

Chapter 2. Purpose

This RSK is an evaluation tool for Renesas microcontrollers.

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.

Features include:

- Renesas Microcontroller Programming.
- User Code Debugging.
- User Circuitry such as Switches, LEDs and potentiometer.
- User or Example Application.
- Sample peripheral device initialisation code.

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

Chapter 3. Power Supply

3.1. Requirements

This RSK operates from a 5V power supply.

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

All RSK boards are supplied with an E10A debugger. This product is able to power the RSK board with up to 300mA. When the RSK is connected to another system then that system should supply power to the RSK.

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

Warning

The RSK is neither under nor over voltage protected. Use a centre positive supply for this board.

3.2. Power – Up Behaviour

When the RSK is purchased the RSK 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. After 200 flashes, or after pressing a switch the LEDs will 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.

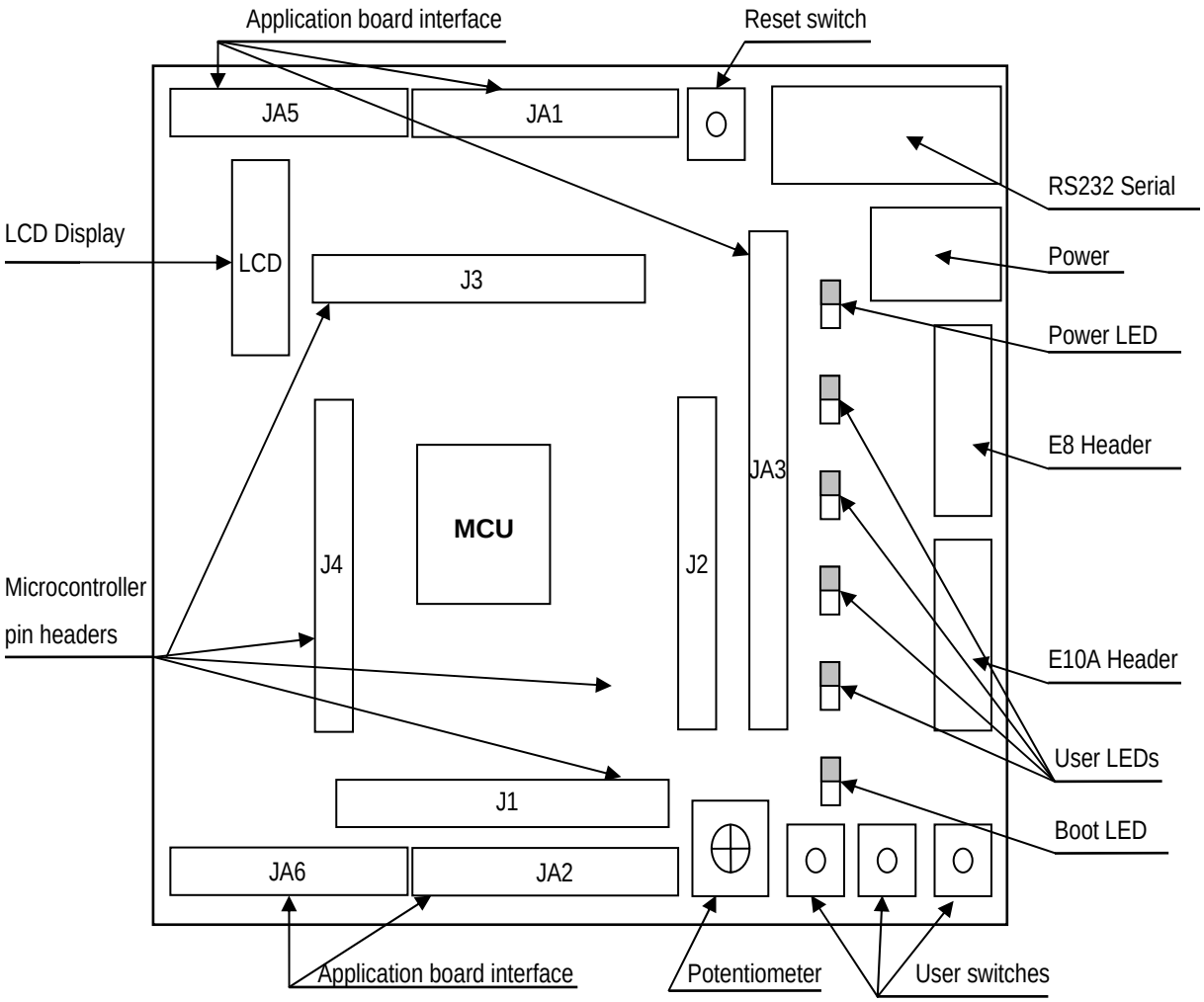


Figure 4-1: Board Layout

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.

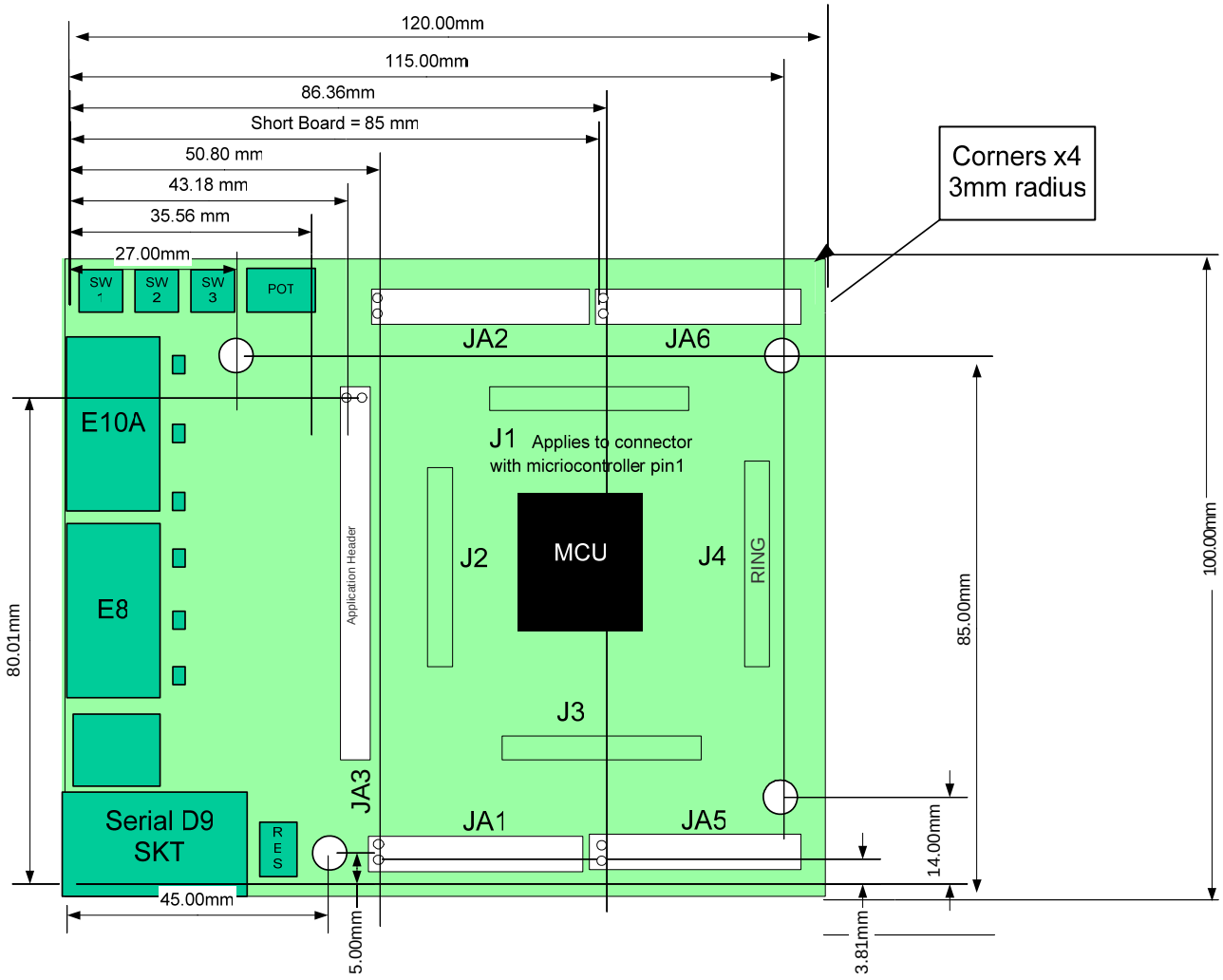


Figure 4-2: Board Dimensions

Chapter 5. Block Diagram

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

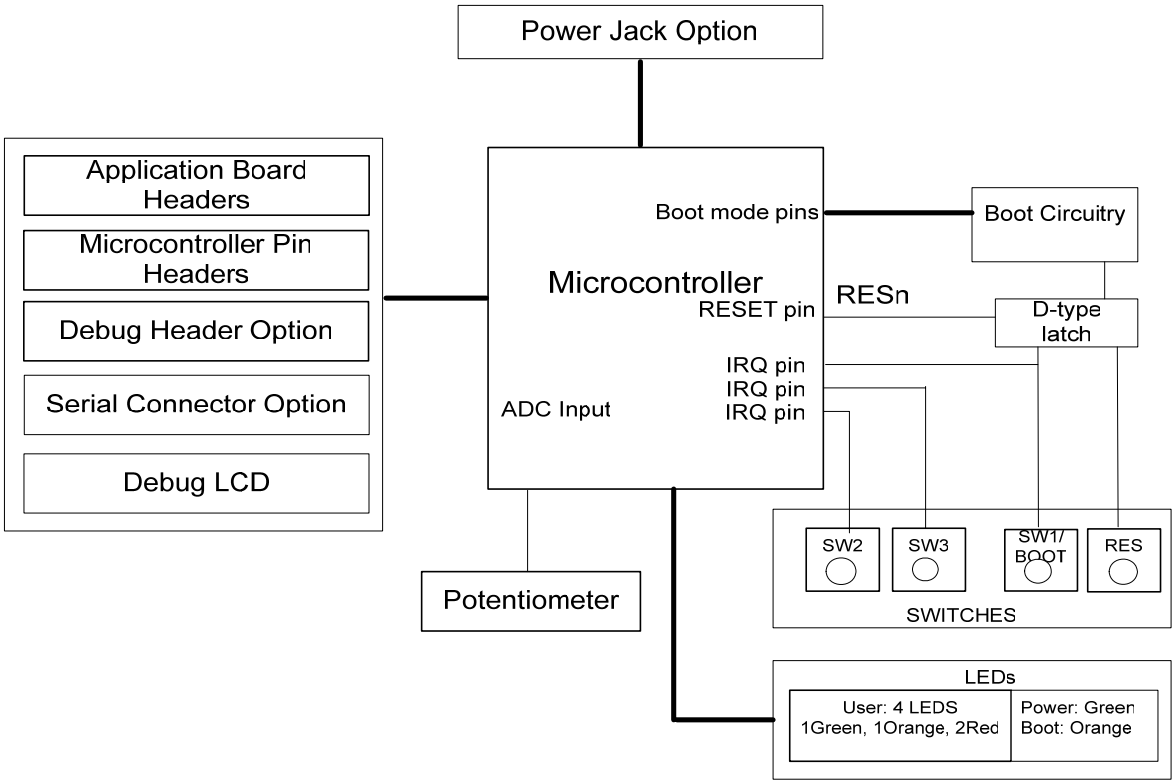


Figure 5-1: Block Diagram

Figure 5-2 shows the connections to the RSK.

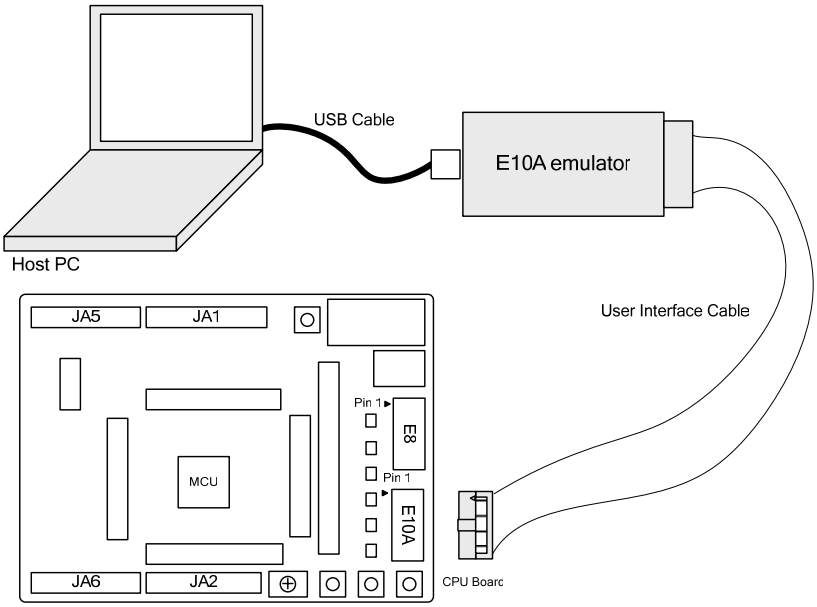


Figure 5-2: RSK Connections

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 RSK microcontroller is reset.	RESn, Pin 91
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 when not using the E10A debugger.	IRQ0n, Pin 84 (Port 1 pin 0)
SW2*	Connects to an IRQ line for user controls.	IRQ1n, Pin 85 (Port 1, pin 1)
SW3*	Connects to the ADC trigger input. Option link allows connection to IRQ line. The option is a pair of 0R links. For more details on option links, please refer to Sec 6.6.	IRQ3n_ADTRGn, Pin 87 (Port 1, pin 3)

Table 6-1: Switch Functions

*Refer to schematic for detailed connectivity information.

6.2. LEDs

There are six LEDs on the RSK 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)	Colour	Microcontroller Port Pin function	Microcontroller Pin Number
LED0	Green	Port C.5	10
LED1	Orange	Port 2.3	53
LED2	Red	Port 6.6	89
LED3	Red	Port 6.7	90

Table 6-2: LED Port

6.3. Potentiometer

A single turn potentiometer is connected to channel AN0 (P5.0) of the microcontroller. This may be used to vary the input analogue voltage value to this pin between AVCC and Ground.

6.4. Serial port

Serial port SCI1 is connected to the standard RS232 header. Serial port SCI4 can optionally be connected to the RS232 header. The connections to be fitted are listed in the Table 6-3.

Description	Function	Circuit Net Name	Device Pin	Fit for RS232	Remove for RS232
SCI1	Programming serial port	TXD1	59	R31	R37, R32
SCI1	Programming serial port	RXD1	55	R30	R36, R33
SCI4	Spare Serial Port	TXD4	107	R37	R31, R32
SCI4	Spare Serial Port	RXD4	108	R36	R30, R33

Table 6-3: Serial Port settings

The SCI1 port is also available on J2 and JA2. The SCI4 port is available on J3.

6.5. Debug LCD Module

A debug LCD module is supplied to be connected to the connector LCD. This should be fitted so that the debug LCD module lies over J3. Care should be taken to ensure the pins are inserted correctly into LCD. The debug LCD module uses a 4 bit interface to reduce the pin allocation. No contrast control is provided; this is set by a resistor on the supplied display module. The module supplied with the RSK only supports 5V operation.

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

LCD					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	Ground	-	2	5V Only	-
3	No Connection	-	4	DLCDRS (P33)	62
5	R/W (Wired to Write only)	-	6	DLCDE + 100k pull down to ground (PC4)	47
7	No Connection	-	8	No connection	-
9	No Connection	-	10	No connection	-
11	DLCDD4 (PC0)	45	12	DLCDD5 (PC1)	46
13	DLCDD6 (PC2)	116	14	DLCDD7 (PC3)	117

Table 6-4 Debug LCD Module Connections

6.6. Option Links

Table 6-5 below describes the function of the option links contained on this RSK board and associated with Serial Port Configuration. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R15	Serial Port Configuration	Connects serial port SCI5 (Rx) to D-type connector (SERIAL).	**Disconnects serial port SCI5 (Rx) from D-type connector (SERIAL).**	R28
R19	Serial Port configuration	Disables RS232 Serial Transceiver	**Enables RS232 Serial Transceiver**	
R28	Serial Port Configuration	Connects serial port SCI5 (Tx) to D-type connector (SERIAL).	**Disconnects serial port SCI5 (Tx) from D-type connector (SERIAL).**	R15
R30	Serial Port Configuration	**Routes serial port SCI1 (Rx) to microcontroller pins.**	Disconnects serial port SCI1 (Rx) from microcontroller pins.	R31, R32, R33
R31	Serial Port Configuration	**Routes serial port SCI1 (Tx) to microcontroller pins.**	Disconnects serial port SCI1 (Tx) from microcontroller pins.	R30, R32, R33
R32	Serial Port Configuration	Routes serial port to JA6 pins.	**Disconnects serial port from JA6 pins.**	R30, R31, R33
R33	Serial Port Configuration	Routes serial port to JA6 pins.	**Disconnects serial port from JA6 pins.**	R30, R31, R32
R36	Serial Port Configuration	Connects programming port SCI4 (Rx) to D-type connector (SERIAL).	**Disconnects programming port SCI4 (Rx) from D-type connector (SERIAL).**	R37
R37	Serial Port Configuration	Connects programming port SCI4 (Tx) to D-type connector (SERIAL).	**Disconnects programming port SCI4 (Tx) from D-type connector (SERIAL).**	R36

Table 6-5: Serial port configuration links.

Table 6-6 below describes the function of the option links associated with application board interface. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R53	Application board interface	Use AN0 of application board interface.	**Connects analog channel AN0 of the MCU to AD_POT**	R95
R54	Application board interface	Use AN6 of application board interface.	**Use DA0 of application board interface.**	R123

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R59	Application board interface	Use PTRX of application board interface.	Use RXD4 of application board interface.	R76
R66	Application board interface	Use TRSTn of application board interface.	Use SCK4 of application board interface.	R79
R67	Application board interface	Use DACKn of application board interface.	Use TCLKC of application board interface.	R78
R69	Application board interface	Use IO_1 of application board interface.	Use CS1n of application board interface.	R114
R70	Application board interface	Use PTTX of application board interface.	Use TXD4 of application board interface.	R82
R74	Application board interface	Use ADTRGn of application board interface.	Use IRQ3n of application board interface.	R88
R75	Application board interface	Use A22 of application board interface.	Use RXD5 of application board interface.	R81
R76	Application board interface	Use RXD4 of application board interface.	Use PTRX of application board interface.	R59
R78	Application board interface	Use TCLKC of application board interface.	Use DACKn of application board interface.	R67
R79	Application board interface	Use SCK4 of application board interface.	Use TRSTn of application board interface.	R66
R81	Application board interface	Use RXD5 of application board interface.	Use A22 of application board interface.	R75
R82	Application board interface	Use TXD4 of application board interface.	Use PTTX of application board interface.	R70
R84	Application board interface	Use A21 of application board interface.	Use TXD5 of application board interface.	R90
R88	Application board interface	Use IRQ3n of application board interface.	Use ADTRGn of application board interface.	R74
R90	Application board interface	Use TXD5 of application board interface.	Use A21 of application board interface.	R84
R95	Application board interface	Connects analog channel AN0 of the MCU to AD_POT	Use AN0 of application board interface.	R53
R114	Application board interface	Use CS1n of application board interface.	Use IO_1 of application board interface.	R69
R115	Application board interface	Use IO_3 of application board interface.	Use CS3n of application board interface.	R116

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R116	Application board interface	**Use CS3n of application board interface.**	Use IO_3 of application board interface.	R115
R123	Application board interface	**Use DA0 of application board interface.**	Use AN6 of application board interface.	R54
R135	Application board interface	**Use TDO of application board interface.**	Use WDT_OVFn of application board interface.	R157
R136	Application board interface	**Use DA1 of application board interface.**	Use AN7 of application board interface.	R150
R137	Application board interface	**Use CS0n of application board interface.**	Use IO_0 of application board interface.	R151
R142	Application board interface	**Use Un of application board interface.**	Use TIOCB0 of application board interface.	R156
R143	Application board interface	**Use Up of application board interface.**	Use TIOCA0 of application board interface.	R158
R150	Application board interface	Use AN7 of application board interface.	**Use DA1 of application board interface.**	R136
R151	Application board interface	Use IO_0 of application board interface.	**Use CS0n of application board interface.**	R137
R156	Application board interface	Use TIOCB0 of application board interface.	**Use Un of application board interface**	R142
R157	Application board interface	Use WDT_OVFn of application board interface.	**Use TDO of application board interface.**	R135
R158	Application board interface	Use TIOCA0 of application board interface.	**Use Up of application board interface.**	R143

Table 6-6: Application board interface links.

Table 6-7 below describes the function of the option links associated with E8 and E10A debuggers. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R4	E8	**Enables E8**		
R118	E8	**Programming Flash not using SERIAL port.**	Programming Flash using SERIAL port.	
R131	E8	If fitted or J7 is set board uses User Boot Mode.	**Removed or J7 isn't set board doesn't use User Boot Mode.**	
R132	E10A	Enables E10A, also can be enabled by fitting J5.	**E10A is disabled, can be enabled if J5 is set.**	

Table 6-7: E8 and E10A debugger links.

Table 6-8 below describes the function of the option links associated with power source. The default configuration is indicated by BOLD text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R178	Power source	**Enables power from E8.**	Disable E8 power source	
R179	Power source	**Board can be powered from external source CON_3V3 (JA1 header pin 3)**	Board can't be powered from external source CON_3V3 (JA1 header pin 3)	R181
R180	Power source	**Enables power from external source.**	Disable external power connector.	
R181	Power source	**Fitted if board is not powered from external source CON_3V3 (JA1 header pin 3)**	Removed if board is powered from external source CON_3V3 (JA1 header pin 3)	R179, R182
R182	Power source	**Enables power to board peripheral devices.**	Disconnects power from board peripheral devices.	R179, R183
R183	Power source	**Board can be powered from external source CON_5V (JA1 header pin 1)**	Board can't be powered from external source CON_5V (JA1 header pin 1).	R179, R182
R184	Ground	**Enables ground connection to ADC module.**	Disconnects ground connection to ADC module.	
R186	MCU power supply	**Supply to MCU.**	CPU current can be measured across R186	
R240	Power source	**Enables VCC power to I2C module, disconnects 5V power from I2C module.**	Disconnects VCC power from I2C module, enables 5V power to I2C module	R241
R241	Power source	Enables 5V power to I2C module, disconnects VCC power from I2C module.	**Disconnects 5V power from I2C module, enables VCC power to I2C module.**	R240

Table 6-8: Power configuration links.

Table 6-9 below describes the function of the option links associated with clock configuration. The default configuration is indicated by BOLD text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R215	Clock Oscillator	**On-board clock source is used**	External clock source is used	
R218	Clock Oscillator	**On-board clock source is used**	External clock source is used	
R219	Clock Oscillator	Parallel resistor for a crystal	**Not fitted**	

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R220	Clock Oscillator	External Clock Source	**On-board Clock Source**	
R221	Clock Oscillator	External Clock Source	**On-board Clock Source**	

Table 6-9: **Clock configuration links.**

Table 6-10 below describes the function of the option links associated with reference voltage source. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R216	Voltage Reference Source	**Voltage Reference set to board Vcc signal.**	Voltage Reference taken from external connector (JA1 pin 7).	R223
R223	Voltage Reference Source	Voltage Reference is taken from external connector (JA1 pin 7).	**Voltage Reference set to board Vcc signal.**	R216

Table 6-10: **Voltage reference links.**

Table 6-11 below describes the function of the option links associated with analog power supply. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R217	Analog Voltage Source	**Analog voltage source from on-board Vcc.**	Analog Voltage Source from external connector.	R222
R222	Analog Voltage Source	Analog Voltage Source from external connector.	**Analog voltage source from on-board Vcc.**	R217
R224	Analog Voltage Source	Analog Voltage Source from external connector.	**Analog voltage source from on board Vcc.**	

Table 6-11: **Analog power supply links.**

Table 6-11 below describes the function of the option links associated with MCU modes. The default configuration is indicated by **BOLD** text.

Option Link Settings				
Reference	Function	Fitted	Alternative (Removed)	Related To
R235	MCU Mode	MCU User Boot Mode enabled, also can be enabled by fitting jumper in J12	MCU User Boot mode disabled	R236
R236	MCU Mode	MCU Extended mode enabled, also can be enabled by fitting jumper in J13	MCU Extended mode disabled	R235

Table 6-12: MCU mode links.

6.7. Oscillator Sources

A crystal oscillator is fitted on the RSK and used to supply the main clock input to the Renesas microcontroller. Table 6-13 details the oscillators that are fitted and alternative footprints provided on this RSK:

Component		
Crystal (X1)	Fitted	12.5 MHz (HC49/4H package)

Table 6-13: Oscillators / Resonators

6.8. Reset Circuit

The CPU Board includes a simple latch circuit that links the mode selection and reset circuit. This provides an easy method for swapping the device between Boot Mode and User mode. 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 on pressing the reset button. This control is subsequently used to modify the mode pin states as required.

The mode pins should change state only while the reset signal is active to avoid possible device damage.

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. Modes

This RSK supports Boot mode, User mode, MCU Extension Mode (ROM Active) and Single Chip mode.

Details of programming the FLASH memory is described in the H8SX/1648 Group Hardware Manual.

7.1. Boot mode

The boot mode settings for this RSK are shown in Table 7-1: Boot Mode pin settings below:

EMLE	MD2	MD1	MD0	LSI State after Reset End
0	0	1	0	Boot Mode

Table 7-1: Boot Mode pin settings

The software supplied with this RSK supports debugging with E10A which does not need Boot mode. To enter Boot mode manually, do not connect the E10A. Press and hold the SW1/BOOT. The BOOT LED will be illuminated to indicate that the microcontroller is in boot mode.

7.2. User boot mode

Refer to H8SX/1648 Group Hardware Manual for details of User Boot Mode. The user mode settings for this RSK are shown in Table 7-2: user Mode pin settings below:

EMLE	MD2	MD1	MD0	LSI State after Reset End
0	0	0	1	User Boot Mode

Table 7-2: User Mode pin settings

7.3. User Extension mode (ROM Active)

Refer to H8SX/1648 Group Hardware Manual for details of User Program Mode. The User Program Mode settings for this RSK are shown in Table 7-3: User Program Mode pin settings below:

EMLE	MD2	MD1	MD0	LSI State after Reset End
0	1	1	0	MCU Extension Mode (ROM Active)

Table 7-3: MCU Extension Mode (ROM Active) pin settings

7.4. Singe chip mode

This is default operating mode of this RSK. Refer to H8SX/1648 Group Hardware Manual for details of Single chip mode. The Single chip mode settings for this RSK are shown in Table 7-4: Single chip mode pin settings below:

EMLE	MD2	MD1	MD0	LSI State after Reset End
0	1	1	1	Single chip Mode

Table 7-4: Single chip Mode pin settings

Chapter 8. Programming Methods

The board is intended for use with HEW and the supplied E10A debugger. Refer to H8SX/1648 Group Hardware Manual for details of programming the microcontroller without using these tools. Please note that to use E10A debugger, jumper J5 must be fitted.

Chapter 9. Headers

9.1. Microcontroller Headers

Table 9-1 to Error! Reference source not found. show the microcontroller pin headers and their corresponding microcontroller connections. The header pins connect directly to the microcontroller pin unless otherwise stated.

J1					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	CS1n_IO1	1	2	IO_2	2
3	CS3n_IO3	3	4	GROUND	4
5	IO_7	5	6	UC_VCC	6
7	MD2	7	8	PIN8	8
9	PIN9	9	10	LED0	10
11	SCK5	11	12	RXD5_A22	12
13	TXD5_A21	13	14	A20	14
15	A19	15	16	GROUND	16
17	A18	17	18	A17	18
19	A16	19	20	A15	20
21	A14	21	22	A13	22
23	GROUND	23	24	A12	24
25	UC_VCC	25	26	A11	26
27	A10	27	28	A9	28
29	A8	29	30	A7	30
31	A6	31	32	GROUND	32
33	A5	33	34	A4	34
35	A3	35	36	A2	36

Table 9-1: J1

J2					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	A1	37	2	A0	38
3	EMLE	39	4	PIN40	40
5	PIN41	41	6	IO_4	42
7	IO_5	43	8	IO_6	44
9	DLCDD4	45	10	DLCDD5	46
11	DLCDE	47	12	GROUND	48
13	TRIGa	49	14	UC_VCC	50
15	TRIGb	51	16	TMR0	52
17	LED1	53	18	SCK1	54
19	RXD1	55	20	Up_TIOCA0	56
21	Un_TIOCB0	57	22	TIOCC0	58
23	TXD1	59	24	TMR1	60
25	NMI	61	26	DLCDRS	62
27	Vp	63	28	UC_VCC	64
29	D0	65	30	D1	66
31	D2	67	32	D3	68
33	GROUND	69	34	D4	70
35	D5	71	36	D6	72

Table 9-2: J2

J3					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	D7	73	2	UC_VCC	74
3	D8	75	4	D9	76
5	D10	77	6	D11	78
7	GROUND	79	8	D12	80
9	D13	81	10	D14	82
11	D15	83	12	IRQ0n	84
13	IRQ1n	85	14	IRQ2n	86
15	IRQ3n_ADTRGn	87	16	GROUND	88
17	LED2	89	18	LED3	90
19	RESn	91	20	NC	92
21	DREQn	93	22	TENDn	94
23	TDO_WDTOVFn	95	24	GROUND	96
25	CON_XTAL	97	26	CON_EXTAL	98
27	UC_VCC	99	28	DACKn_TCLKC	100
29	TCLKD	101	30	STBYn	102
31	GROUND		32	Vn	104
33	Wp	105	34	Wn	106
35	PTTX_TXD4	107	36	PTRX_RXD4	108

Table 9-3: J3

J4					
Pin	Circuit Net Name	Device Pin	Pin	Circuit Net Name	Device Pin
1	TRSTn_SCK4	109	2	NC	
3	TMS	111	4	NC	
5	TDI	113	6	TCK	114
7	MD0	115	8	DLCDD6	116
9	DLCDD7	117	10	ADPOT_AN0	118
11	AN1	119	12	AN2	120
13	CON_AVCC	121	14	AN3	122
15	AVSS	123	16	AN4	124
17	CON_VREF	125	18	AN5	126
19	DA0_AN6	127	20	DA1_AN7	128
21	AN8	129	22	AN9	130
23	AN10	131	24	AN11	132
25	MD1	133	26	UD	134
27	WRn	135	28	TRISTn	136
29	LLWRn	137	30	LHWRn	138
31	RDn	139	32	ASn	140
33	GROUND	141	34	BCLK	142
35	UC_VCC	143	36	CS0n_IO0	144

Table 9-4: J4

9.2. Application Headers

Table 9-5 to Table 9-9 below show the standard application header connections.

JA1							
Pin	Generic Header Name	CPU board Signal Name	Device Pin	Pin	Generic Header Name	CPU board Signal Name	Device Pin
1	5V	CON_5V	-	2	0V	GROUND	-
3	3V3	CON_3V3	-	4	0V	GROUND	-
5	AVCC	CON_AVCC	121	6	AVss	AVSS	123
7	AVref	CON_VREF	125	8	ADTRG	ADTRGn	87
9	AD0	AN0	118	10	AD1	AN1	119
11	AD2	AN2	120	12	AD3	AN3	122
13	DAC0	DA0	127	14	DAC1	DA1	128
15	IO_0	IO_0	144	16	IO_1	IO_1	1
17	IO_2	IO_2	2	18	IO_3	IO_3	3
19	IO_4	IO_4	42	20	IO_5	IO_5	43
21	IO_6	IO_6	44	22	IO_7	IO_7	5
23	IRQ3	IRQ3n	87	24	IIC_EX	NC	-
25	IIC_SDA	SDA	8	26	IIC_SCL	IIC_SCL	9

Table 9-5: JA1 Standard Generic Header

JA2							
Pin	Generic Header Name	CPU board Signal Name	Device Pin	Pin	Generic Header Name	CPU board Signal Name	Device Pin
1	RESn	RESn	91	2	EXTAL	CON_EXTAL	98
3	NMIn	NMI	61	4	VSS1	GROUND	-
5	WDT_OVF	WDT_OVFn	95	6	SCIaTX	TXD1	59
7	IRQ0	IRQ0n	84	8	SCIaRX	RXD1	55
9	IRQ1	IRQ1n	85	10	SCIaCK	SCK1	54
11	UD	UD	134	12	CTSRTS	NC	-
13	Up	Up	56	14	Un	Un	57
15	Vp	Vp	63	16	Vn	Vn	104
17	Wp	Wp	105	18	Wn	Wn	106
19	TMR0	TMR0	52	20	TMR1	TMR1	60
21	TRIGa	TRIGa	49	22	TRIGb	TRIGb	51
23	IRQ2	IRQ2n	86	24	TRISTn	TRISTn	136
25	-	-		26	-	-	-

Table 9-6: JA2 Standard Generic Header

JA5							
Pin	Generic Header Name	CPU board Signal Name	Device Pin	Pin	Generic Header Name	CPU board Signal Name	Device Pin
1	AD4	AN4	124	2	AD5	AN5	126
3	AD6	AN6	127	4	AD7	AN7	128
5	CAN1TX	-	-	6	CAN1RX	-	-
7	CAN2TX	-	-	8	CAN2RX	-	-
9	AD8	AN8	129	10	AD9	AN9	130
11	AD10	AN10	131	12	AD11	AN11	132
13	TIOC0A	TIOCA0	56	14	TIOC0B	TIOCB0	57
15	TIOC0C	TIOCC0	58	16	M2_TRISTn	-	-
17	TCLKC	TCLKC	100	18	TCLKD	TCLKD	101
19	M2_Up	-	-	20	M2_Un	-	-
21	M2_Vp	-	-	22	M2_Vn	-	-
23	M2_Wp	-	-	24	M2_Wn	-	-

Table 9-7: JA5 Standard Generic Header

JA6							
Pin	Generic Header Name	CPU board Signal Name	Device Pin	Pin	Generic Header Name	CPU board Signal Name	Device Pin
1	DREQ	DREQn	93	2	DACK	DACKn	100
3	TEND	TENDn	94	4	STBYn	STBYn	102
5	RS232TX	RS232TX	-	6	RS232RX	RS232RX	-
7	SCIbRX	RXD4	108	8	SCIbTX	TXD4	107
9	SCIcTX	TXD5	13	10	SCIbCK	SCK4	109
11	SCIcCK	SCK5	11	12	SCIcRX	RXD5	12
13	-	-	-	14	-	-	-
15	-	-	-	16	-	-	-
17	-	-	-	18	-	-	-
19	-	-	-	20	-	-	-
21	-	-	-	22	-	-	-
23	-	-	-	24	-	-	-

Table 9-8: JA6 Standard Generic Header

JA3							
Pin	Generic Header Name	CPU board Signal Name	Device Pin	Pin	Generic Header Name	CPU board Signal Name	Device Pin
1	A0	A0	38	2	A1	A1	37
3	A2	A2	36	4	A3	A3	35
5	A4	A4	34	6	A5	A5	33
7	A6	A6	31	8	A7	A7	30
9	A8	A8	29	10	A9	A9	28
11	A10	A10	27	12	A11	A11	26
13	A12	A12	24	14	A13	A13	22
15	A14	A14	21	16	A15	A15	20
17	D0	D0	65	18	D1	D1	66
19	D2	D2	67	20	D3	D3	68
21	D4	D4	70	22	D5	D5	71
23	D6	D6	72	24	D7	D7	73
25	RDn	RDn	139	26	WRn	WRn	135
27	CS0n	CS0n	144	28	CS1n	CS1n	1
29	D8	D8	75	30	D9	D9	76
31	D10	D10	77	32	D11	D11	78
33	D12	D12	80	34	D13	D13	81
35	D14	D14	82	36	D15	D15	83
37	A16	A16	19	38	A17	A17	18
39	A18	A18	17	40	A19	A19	15
41	A20	A20	14	42	A21	A21	13
43	A22	A22	12	44	SDCLK	BCLK	142
45	CS2n	CS3n	3	46	ALE	ASn	140
47	WRHn	LHWRn	138	48	WRLn	LLWRn	137
49	CASn	-	-	50	RASn	-	-

Table 9-9: JA3 Standard Generic Header

Chapter 10. Code Development

10.1. Overview

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

10.2. 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 64k code and data. To use the compiler with programs greater than this size you need to purchase the full tools from your distributor.

Warning: The protection software for the compiler will detect changes to the system clock. Changes to the system clock back in time may cause the trial period to expire prematurely.

10.3. Mode Support

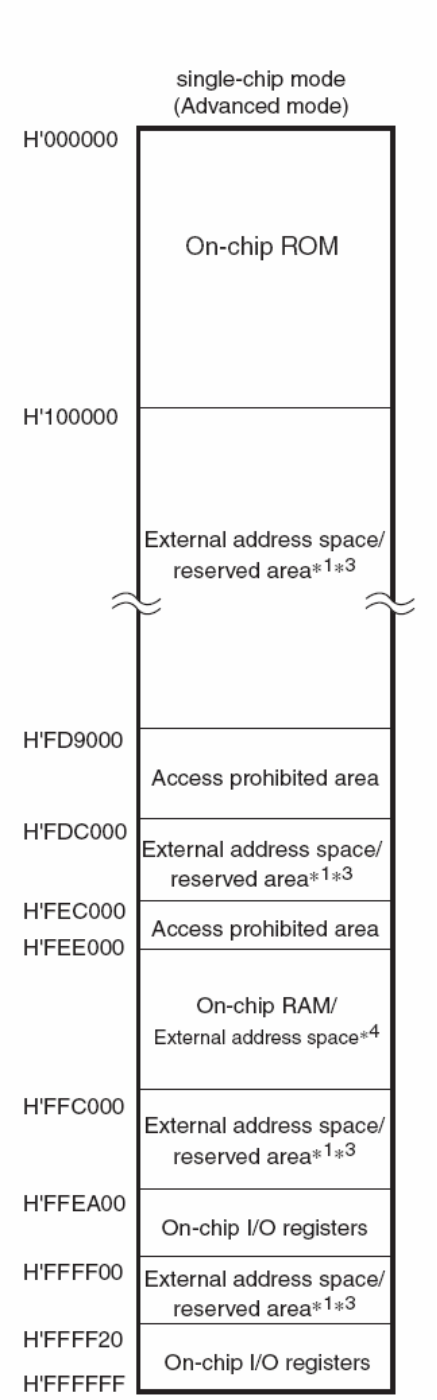
HEW connects to the Microcontroller and programs it via the E10A. Mode support is handled transparently to the user.

10.4. Breakpoint Support

HEW supports breakpoints on the user code, both in RAM and ROM.

Double clicking in the breakpoint column in the code sets the breakpoint. Breakpoints will remain unless they are double clicked to remove them.

10.5. Memory Map



Notes:1. This area is specified as the external address space when EXPE = 1 and the reserved area when EXPE = 0.
2. The on-chip RAM is used for flash memory programming. Do not clear the RAME bit in SYSCR to 0.
3. Do not access the reserved areas.
4. This area is specified as the external address space by clearing the RAME bit in SYSCR to 0.

Figure 10-1: Memory Map

Chapter 11.Component Placement

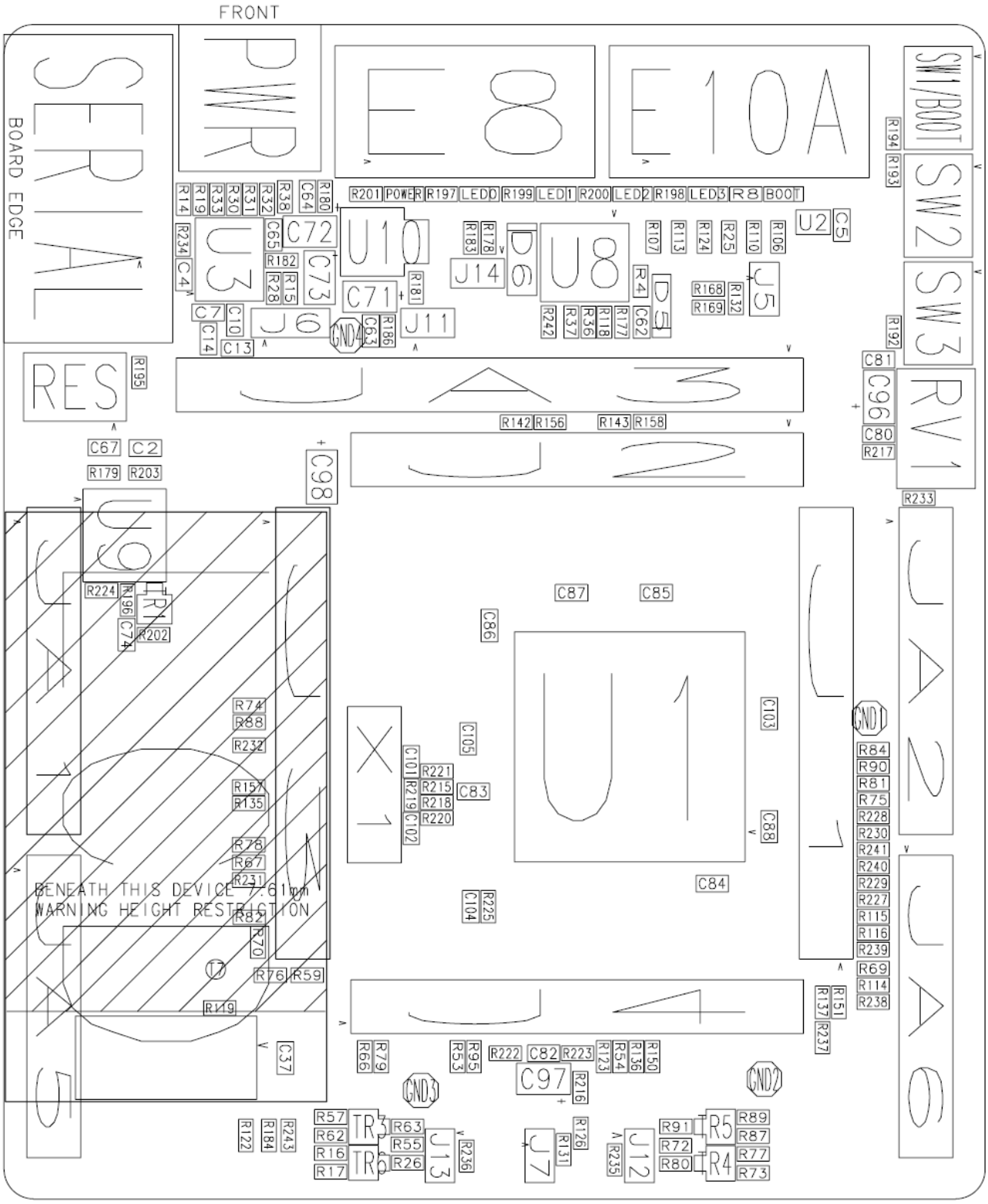


Figure 11-1: Component Placement – Top Layer

Chapter 12. Additional Information

For details on how to use High-performance Embedded Workshop (HEW, refer to the HEW manual available on the CD or from the web site.

For information about the H8SX/1648 series microcontrollers refer to the H8SX/1648 Group hardware manual.

For information about the H8SX/1648 assembly language, refer to the H8SX Series Software Manual.

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

Technical Contact Details

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Japan: csc@renesas.com

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

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User's Manual

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