

# RX62T Group

## Renesas Starter Kit User's Manual

RENESAS MCU  
RX Family / RX600 Series

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This Renesas Starter Kit is only intended for use in a laboratory environment under ambient temperature and humidity conditions. A safe separation distance should be used between this and any sensitive equipment. Its use outside the laboratory, classroom, study area or similar such area invalidates conformity with the protection requirements of the Electromagnetic Compatibility Directive and could lead to prosecution.

The product generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off or on, you are encouraged to try to correct the interference by one or more of the following measures;

- ensure attached cables do not lie across the equipment
- reorient the receiving antenna
- increase the distance between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that which the receiver is connected
- power down the equipment when not in use
- consult the dealer or an experienced radio/TV technician for help NOTE: It is recommended that wherever possible shielded interface cables are used.

The product is potentially susceptible to certain EMC phenomena. To mitigate against them it is recommended that the following measures be undertaken;

- The user is advised that mobile phones should not be used within 10m of the product when in use.
- The user is advised to take ESD precautions when handling the equipment.

The Renesas Starter Kit does not represent an ideal reference design for an end product and does not fulfil the regulatory standards for an end product.

# How to Use This Manual

## 1. Purpose and Target Readers

This manual is designed to provide the user with an understanding of the RSK hardware functionality, and electrical characteristics. It is intended for users designing sample code on the RSK platform, using the many different incorporated peripheral devices.

The manual comprises of an overview of the capabilities of the RSK product, but does not intend to be a guide to embedded programming or hardware design. Further details regarding setting up the RSK and development environment can found in the tutorial manual.

Particular attention should be paid to the precautionary notes when using the manual. These notes occur within the body of the text, at the end of each section, and in the Usage Notes section.

The revision history summarizes the locations of revisions and additions. It does not list all revisions. Refer to the text of the manual for details.

The following documents apply to the RX62T Group. Make sure to refer to the latest versions of these documents. The newest versions of the documents listed may be obtained from the Renesas Electronics Web site.

Document Type	Description	Document Title	Document No.
User's Manual	Describes the technical details of the RSK hardware.	RSKRX62T User's Manual	REJ10J2194
Software Manual	Describes the functionality of the sample code, and its interaction with the Renesas Peripheral Driver Library (RPDL)	RSKRX62T Software Manual	REJ10J2197
Tutorial	Provides a guide to setting up RSK environment, running sample code and debugging programs.	RSKRX62T Tutorial Manual	REJ10J2195
Quick Start Guide	Provides simple instructions to setup the RSK and run the first sample, on a single A4 sheet.	RSKRX62T Quick Start Guide	REJ10J2196
Schematics	Full detail circuit schematics of the RSK.	RSKRX62T Schematics	RJJ99J0072
Hardware Manual	Provides technical details of the RX62T microcontroller.	RX62T Group Hardware Manual	R01UH0034EJ0100

## 2. List of Abbreviations and Acronyms

<b>Abbreviation</b>	<b>Full Form</b>
ADC	Analogue-to-Digital Converter
bps	bits per second
CAN	Controller-Area Network
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
DMA	Direct Memory Access
E1	On-chip Debugger
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
HEW	High-performance Embedded Workshop
IIC	Philips™ Inter-Integrated Circuit connection bus
IRQ	Interrupt Request
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	Micro-controller Unit
MTU	Multifunction Timer Unit
PC	Program Counter
PWM	Pulse Width Modulation
RSK	Renesas Starter Kit
RAM	Random Access Memory
SFR	Special Function Register
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus

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## 1. Overview

### 1.1 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.

### 1.2 Features

This RSK provides an evaluation of the following features:

- Renesas microcontroller programming
- User code debugging
- User circuitry such as switches, LEDs and a potentiometer
- Sample application
- Sample peripheral device initialisation code

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

## 2. Power Supply

### 2.1 Requirements

This RSK is supplied with an E1 debugger. The debugger is able to power the RSK board with up to 200mA. When the RSK is connected to another system then that system should supply power to the RSK. All RSK and RSK+ boards have an optional centre positive supply connector using a 2.0mm barrel power jack.

This RSK supports one voltage input. Details of the external power supply connection are shown in **Table 2-1** below.

Connector	Supply Voltages	J13 Setting	J14 Setting
PWR	Regulated, 5V DC	Do Not Fit	Do Not Fit

**Table 2-1: Main Power Supply Requirements**

This RSK should only be supplied with a regulated power supply.
-----------------------------------------------------------------

### 2.2 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 any switch, the LEDs will flash at a rate controlled by the potentiometer.

### 3. Board Layout

#### 3.1 Component Layout

Figure 3-1 below shows the top component layout of the board.

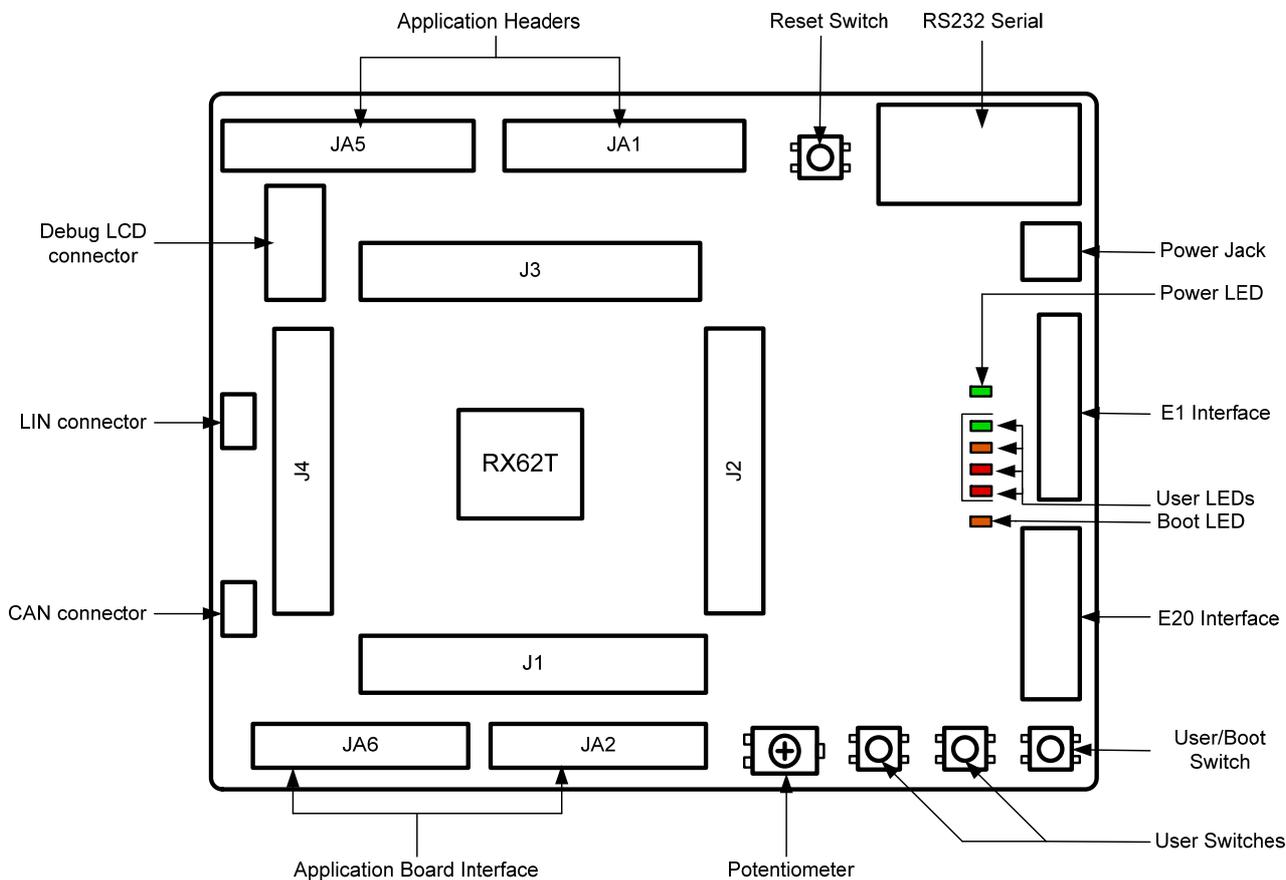


Figure 3-1: Board Layout

### 3.2 Board Dimensions

Figure 3-2 below gives the board dimensions and connector positions. All the through-hole connectors are on a common 0.1 inch grid for easy interfacing.

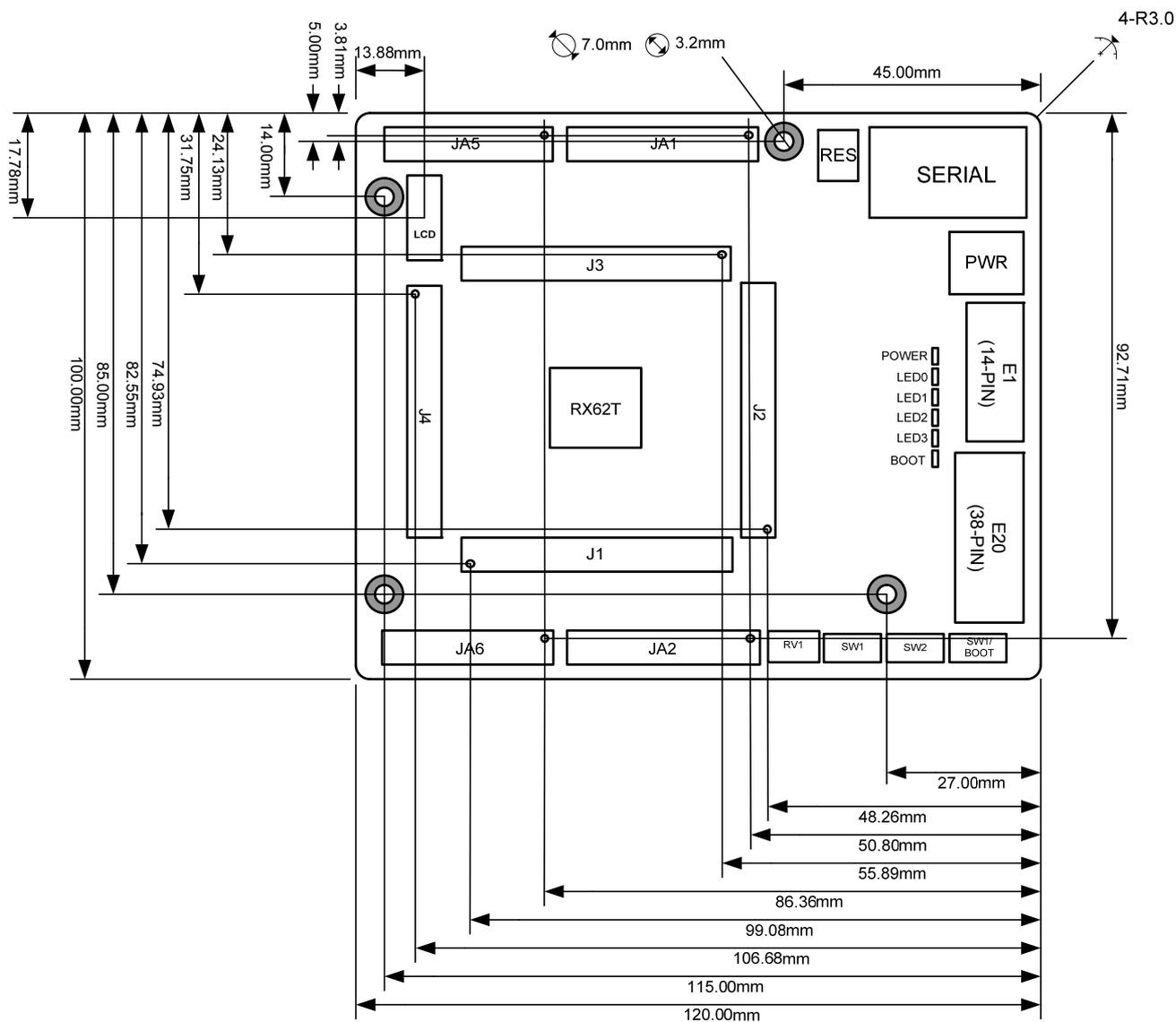


Figure 3-2: Board Dimensions

### 3.3 Component Placement

Figure 3-3 below shows placement of individual components on the top-side PCB – bottom-side component placement can be seen in Figure 3-4, overleaf. Component types and values can be looked up using the board schematics.

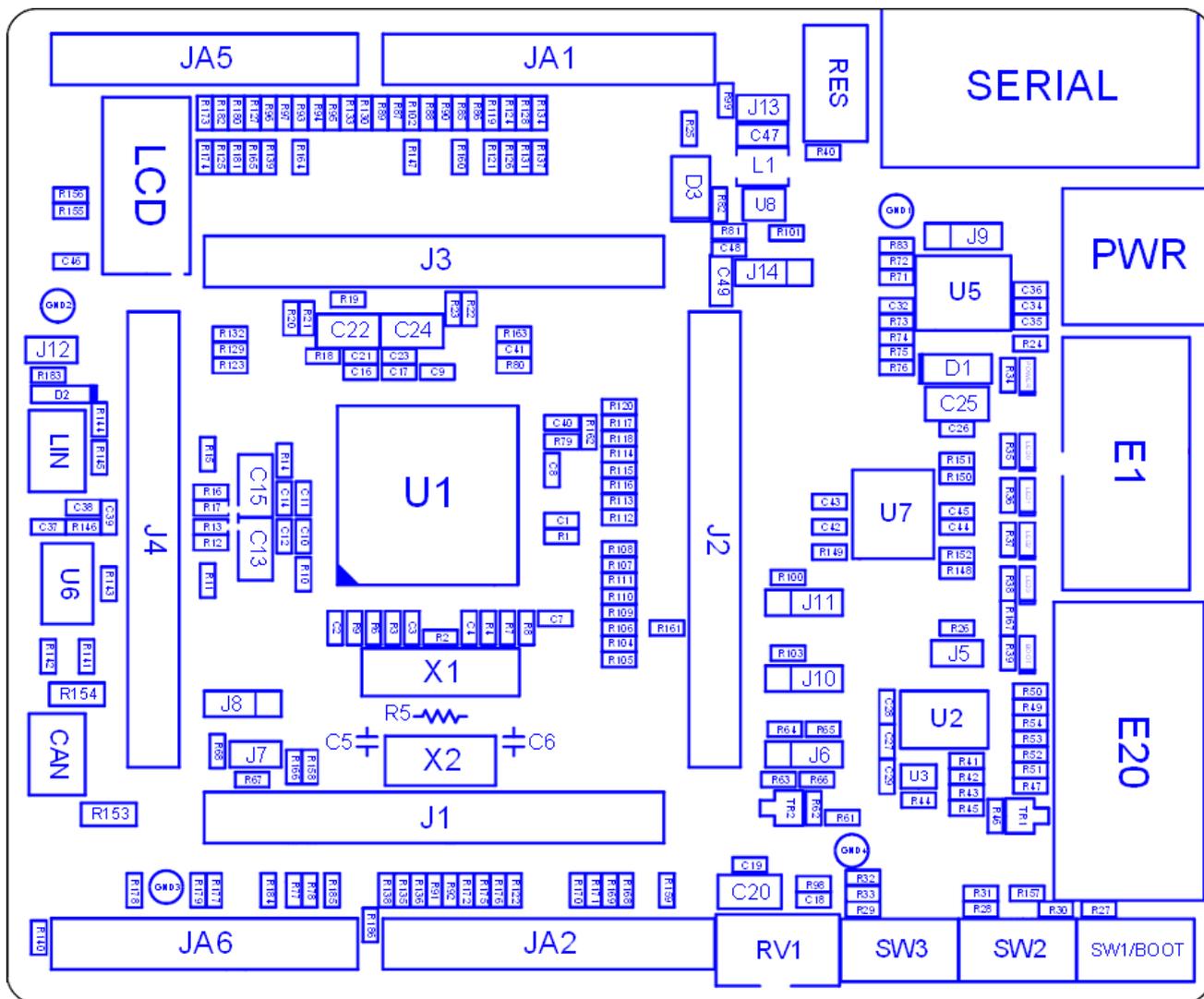


Figure 3-3: Top-Side Component Placement

Figure 3-4 below shows the component placement on the bottom-side of the RSK board.

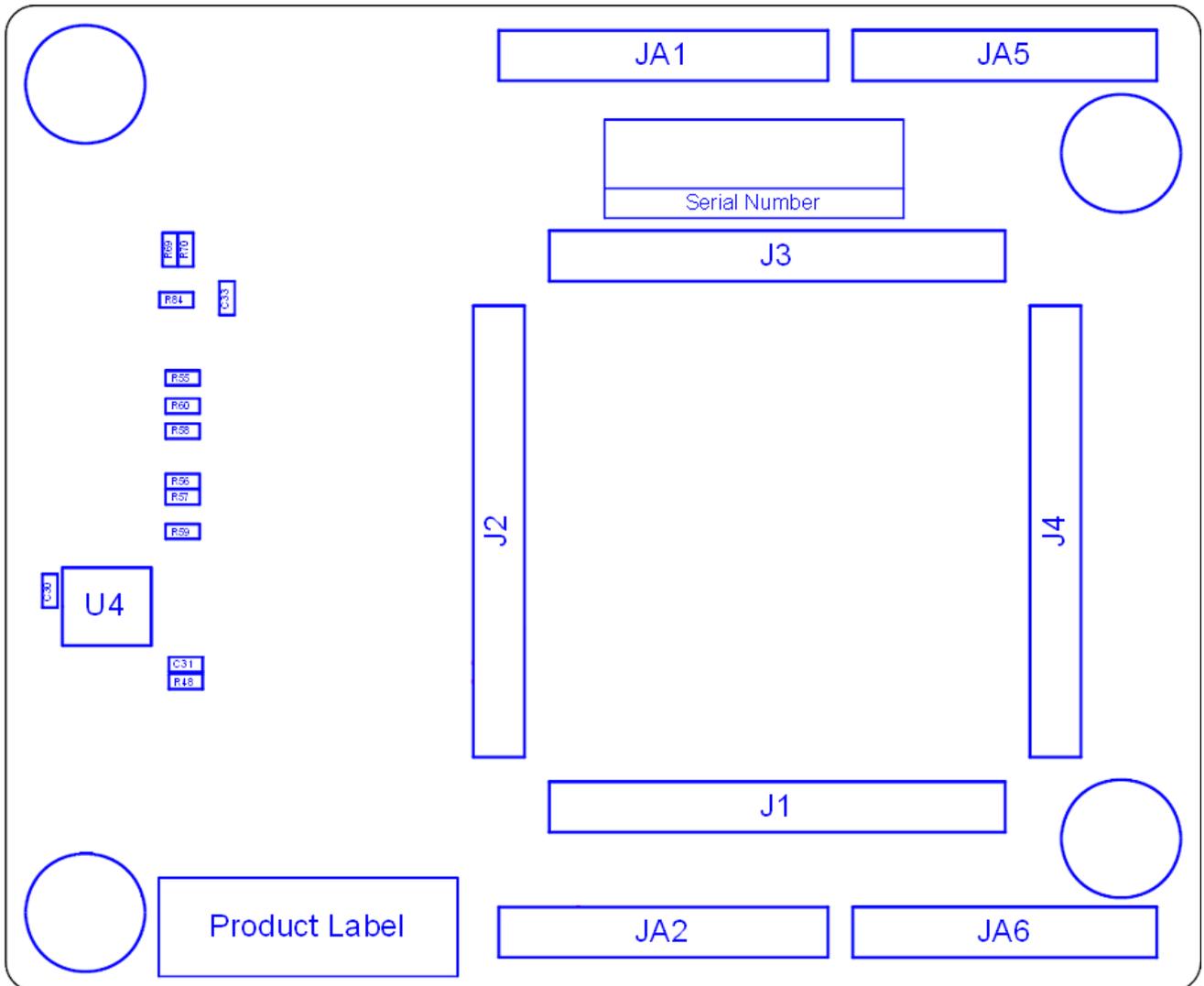


Figure 3-4: Bottom-Side Component Placement

## 4. Connectivity

### 4.1 Internal RSK Connections

The diagram below shows the RSK board components and their connectivity to the MCU.

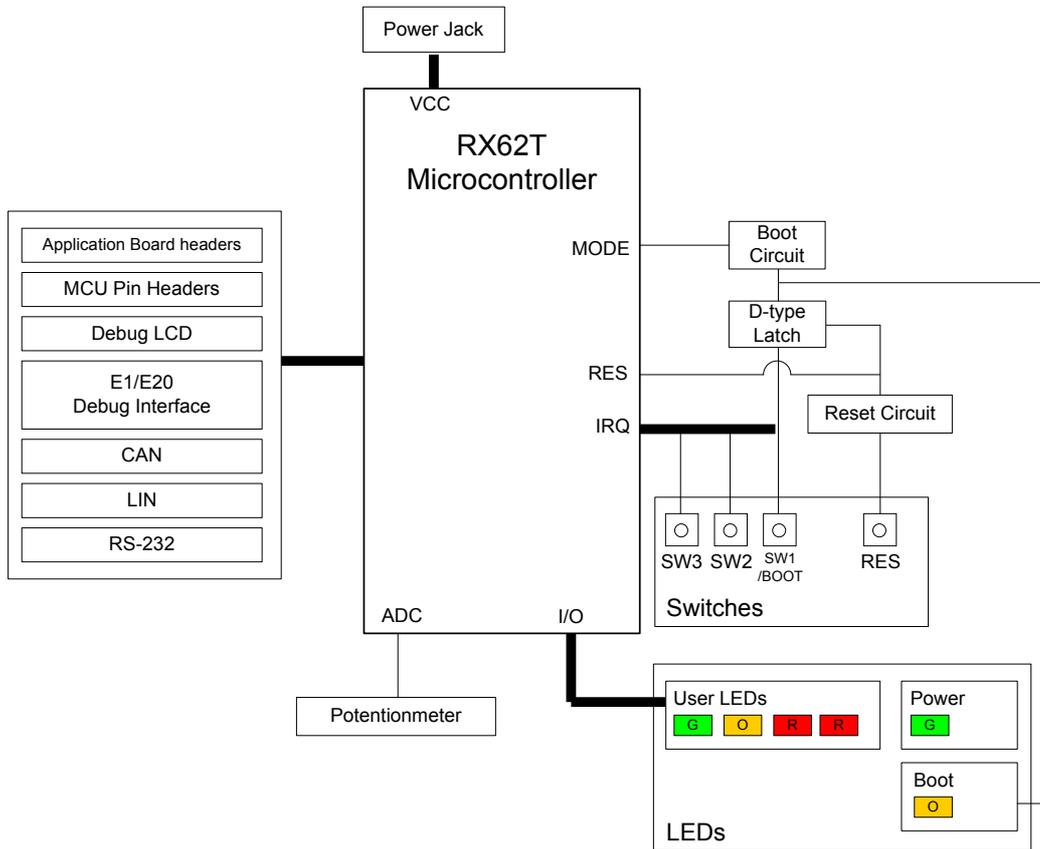
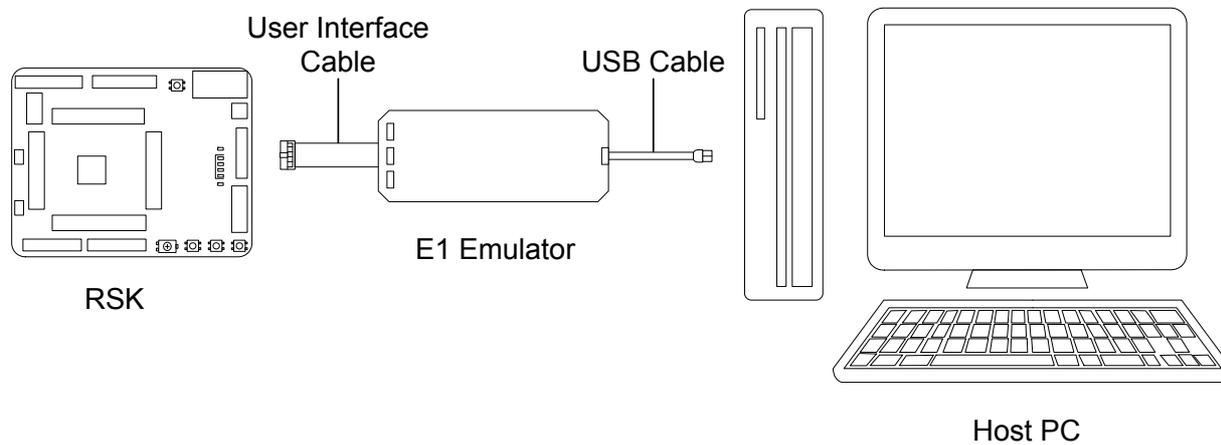


Figure 4-1: Internal RSK Block Diagram

## 4.2 Debugger Connections

The diagram below shows the connections between the RSK, E1 debugger and the host PC.



**Figure 4-2: Debugger Connection Diagram**

## 5. User Circuitry

### 5.1 Reset Circuit

A reset control circuit is fitted to the RSK to generate the required reset signal, and is triggered from the RES switch. Refer to the RX62T hardware manual for details regarding the reset signal timing requirements, and the RSKRX62T board schematics for information regarding the reset circuitry in use on the RSK.

### 5.2 Clock Circuit

A clock circuit is fitted to the RSK to generate the required clock signal to drive the MCU, and associated peripherals. Refer to the RX62T hardware manual for details regarding the clock signal requirements, and the RSKRX62T board schematics for information regarding the clock circuitry in use on the RSK. Details of the oscillators fitted to the RSK are listed in **Table 5-1** below.

Crystal	Function	Default Placement	Frequency	Device Package
X1	Main MCU oscillator.	Fitted	12.5MHz	HC49/4U
X2	Internal RSK Testing Only	Unfitted	n/a	n/a

**Table 5-1: Oscillators**

### 5.3 Switches

There are four switches located on the RSK board. The function of each switch and its connection is shown in **Table 5-2**. For further information regarding switch connectivity, refer to the RSKRX62T board schematics.

Switch	Function	MCU Connection
RES	When pressed, the microcontroller is reset.	RES#, Pin 10
SW1/BOOT	Connects to an IRQ input for user controls.	PE5, Pin 01
SW2	Connects to an IRQ input for user controls.	PE4, Pin 08
SW3/ADTRG	Connects to an IRQ input for user controls. The switch is also connected to an ADTRG input, and is used to trigger AD conversions.	PB4, Pin 30

**Table 5-2: Switch Connections**

### 5.4 LEDs

There are ten LEDs on the RSK board. The function of each LED, its colour, and its connections are shown in **Table 5-3**.

LED	Colour	Function	MCU Connection
PWR	Green	Indicates the status of the 5V power rail.	No connection
Boot	Orange	Indicates the status of the on-board programming selected	No connection
LED0	Green	User operated LED.	P71, Pin 56
LED1	Orange	User operated LED.	P72, Pin 55
LED2	Red	User operated LED.	P73, Pin 54
LED3	Red	User operated LED.	P33, Pin 58

**Table 5-3: LED Connections**

## 5.5 Potentiometer

A single-turn potentiometer is connected as a potential divider to analogue input AN0, P60. The potentiometer can be used to create a voltage between AVCC and ground (by default, AVCC is connected to the board 5V supply).

The potentiometer is fitted to offer an easy method of supplying a variable analogue input to the microcontroller. It does not necessarily reflect the accuracy of the controller's ADC. Refer to the device hardware manual for further details.

## 5.6 Debug LCD Module

A debug LCD module is supplied with the RSK, and should be connected to the LCD header, LCD1.

Care should be taken when installing the LCD module to ensure pins are not bent or damaged. The LCD module is vulnerable to electrostatic discharge (ESD); therefore appropriate ESD protection should be used.

The debug LCD module uses a 4-bit interface to reduce pin allocation. No contrast control is provided, as this is set by a resistor supplied on the display module. Connection information for the debug LCD module is provided in **Table 5-4** below.

Debug LCD Header					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	Ground	-	2	Board_5V	-
3	No Connection	-	4	DLCDRS	PE1, Pin 16
5	R/W (Pulled to ground)	-	6	DLCDE (pulled to ground)	PE0, Pin 17
7	No Connection	-	8	No Connection	-
9	No Connection	-	10	No Connection	-
11	MTIOC7D_DLCDD4	P90, Pin 50	12	MTIOC7C_DLCDD5	P91, Pin 49
13	MTIOC6D_DLCDD6	P92, Pin 48	14	MTIOC7B_DLCDD7	P93, Pin 47

**Table 5-4: LCD Header Connections**

## 5.7 RS232 Serial Port

Serial port SCI0 is connected to the standard RS232 header fitted to the RSK. Alternatively, serial port SCI1 or SCI2-A can be connected to the RS232 transceiver by making changes to the configurations to the jumpers and option links (refer to §6). Connections between the RS232 header and the microcontroller are listed in the **Table 5-5**.

SCI Signal	Function	MCU Connection	RS232 Connection
TxD0	SCI0 Transmit Signal.	PB2, Pin 33	Pin 2
RxD0	SCI0 Receive Signal.	PB1, Pin 34	Pin 3
SCK0	SCI0 Clock Signal	PB3, Pin 32	*
TxD1	SCI1 Transmit Signal.	PD3, Pin 22	*
RxD1	SCI1 Receive Signal.	PD5, Pin 20	*
SCK1	SCI1 Clock Signal	PD4, Pin 21	*
TxD2-A	SCI2-A Transmit Signal.	PB5, Pin 28	*
RxD2-A	SCI2-A Receive Signal.	PB6, Pin 27	*
SCK2-A	SCI2-A Clock Signal	PB7, Pin 26	*

**Table 5-5: Serial Port Connections**

\* This connection is not available in the default RSK configuration - refer to §6 for the required modifications.

## 5.8 Controller-Area Network (CAN)

A CAN transceiver IC is fitted to the RSK, and is connected to the CAN MCU peripheral. For further details regarding the CAN protocol and supported modes of operation, please refer to the RX62T hardware manual.

The connections for the CAN microcontroller signals are listed in **Table 5-6** below.

CAN Signal	Function	MCU Connection
CTX-A	CAN Data Transmission.	PB5, Pin 28
CRX-A	CAN Data Reception.	PB6, Pin 27
CANEN	CAN Transceiver Device Enable Control.	P24, Pin 64
CANERRn	CAN Error and Power Status.	P55, Pin 78
CANSTBn	CAN Standby Mode Control.	PB0, Pin 35

**Table 5-6: CAN Connections**

## 5.9 Local-Interconnect Network (LIN)

A LIN transceiver IC is fitted to the RSK, and connected to the LIN MCU peripheral. For further details regarding the LIN protocol and supported modes of operation, please refer to the RX62T hardware manual.

The connections for the LIN microcontroller signals are listed in **Table 5-7** below.

LIN Signal	Function	MCU Connection
LTX	LIN Data Transmission.	P23, Pin 65
LRX	LIN Data Reception.	P22, Pin 66
LINNSLP	LIN Transceiver Device Sleep Control.	PA2, Pin 39

**Table 5-7: LIN Connections**

## 6. Configuration

### 6.1 Modifying the RSK

This section lists the option links that are used to modify the way RSK operates in order to access different configurations. Configurations are made by modifying link resistors or headers with movable jumpers.

A link resistor is a 0Ω surface mount resistor, which is used to short or isolate parts of a circuit. Option links are listed in the following sections, detailing their function when fitted or removed. Bold, blue text indicates the default configuration that the RSK is supplied with. Refer to the component placement diagram (§3) to locate the option links and jumpers.

When removing soldered components, always ensure that the RSK is not exposed to a soldering iron for intervals greater than 5 seconds. This is to avoid damage to nearby components mounted on the RSK.

When modifying a link resistor, always check the related option links to ensure there is no possible signal contention or short circuits. Because many of the MCU's pins are multiplexed, some of the peripherals must be used exclusively. Refer to the RX62T hardware manual and RSKRX62T board schematics for further information.

### 6.2 MCU Configuration

Table 6-1 below details the option links associated with configuring the MCU operating modes and emulator support.

Reference	Position One	Position Two	Position Three	Related Ref.
J6*	Pins 1 and 2 shorted. Do not use this setting.	<b>Pin 2 and 3 shorted.</b> <b>Single Chip Mode &amp; Boot Mode.</b>	All pins open. Single Chip Mode Only	R66
J8	<b>Pins 1 and 2 shorted.</b> <b>Connects EMLE to Board_VCC.</b> <b>Emulator enabled.</b>	<b>Pins 2 and 3 open.</b> <b>Connects EMLE to GROUND.</b> <b>Unused.</b>	All pins open. Do not use this setting.	R68

Table 6-1: MCU Option Links

\*By default, this jumper is not fitted to the RSK. R66 is fitted by default and MD0 is pulled high by R64.

Table 6-2 below details the different configurations and functions of the MCU operating mode jumpers.

Reference	Position One	Position Two	Related Ref.
J7	Pins 1 and 2 shorted. Connects MDE to Board_VCC (pulled to GROUND by R67). Big Endian selected.	<b>Pins 1 and 2 open. Connects MDE to GROUND (pulled by R67).</b>  <b>Little Endian selected.</b>	R67

Table 6-2: MCU Operating Mode Jumpers

### 6.3 ADC Configuration

Table 6-3 below details the function of the option links associated with the Analogue-to-Digital circuit.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R10	<b>Connects VREFL0 (MCU, pin 94) to GROUND.</b>	Disconnects VREFL0 (MCU, pin 94) from GROUND.	R11
R11	Connects VREFL0 (MCU, pin 94) to CON_VREFL0.	<b>Disconnects VREFL0 (MCU, pin 94) from CON_VREFL0.</b>	R10
R12	<b>Connects VREFH0 (MCU, pin 93) to Board_VCC.</b>	Disconnects VREFH0 (MCU, pin 93) from Board_VCC.	R13
R13	Connects VREFH0 (MCU, pin 93) to CON_VREFH0.	<b>Disconnects VREFH0 (MCU, pin B2) from CON_VREFH0.</b>	R12
R14	<b>Connects AVSS0 (MCU, pin 95) to GROUND.</b>	Disconnects AVSS0 (MCU, pin 95) from GROUND.	R15
R15	Connects AVSS0 (MCU, pin 95) to CON_AVSS0.	<b>Disconnects AVSS0 (MCU, pin 95) from CON_AVSS0.</b>	R14
R16	<b>Connects Board_VCC to AVCC0 (MCU, pin 92).</b>	Disconnects Board_VCC from AVCC0 (MCU, pin 92)	R17
R17	Connects AVCC0 (MCU, pin 92) to CON_AVCC0.	<b>Disconnects AVCC0 (MCU, pin 92) from CON_AVCC0.</b>	R16
R18	<b>Connects AVSS (MCU, pin 73) to GROUND.</b>	Disconnects AVSS (MCU, pin 73) from GROUND.	R19
R19	Connects AVSS (MCU, pin 73) to CON_AVSS.	<b>Disconnects AVSS (MCU, pin 73) from CON_AVSS.</b>	R18
R20	<b>Connects VREF (MCU, pin 72) to Board_VCC.</b>	Disconnects VREF (MCU, pin 72) from Board_VCC.	R21
R21	Connects VREF (MCU, pin 72) to CON_AVCC.	<b>Disconnects VREF (MCU, pin 72) from CON_AVCC.</b>	R20
R22	<b>Connects AVCC (MCU, pin 71) to Board_VCC.</b>	Disconnects AVCC (MCU, pin 71) from Board_VCC.	R23
R23	Connects AVCC (MCU, pin 71) to CON_VREF.	<b>Disconnects AVCC (MCU, pin 71) from CON_VREF.</b>	R22

Table 6-3: ADC Option Links

## 6.4 RS232 Serial Port Configuration

Table 6-4 below details the function of the option links associated with serial port configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R69	Connects T2OUT (U5, pin 8) to the serial socket, pin 8.	Disconnects T2OUT (U5, pin 8) from the serial socket, pin 8.	-
R70	Connects R2IN (U5, pin 9) to the serial socket, pin 7.	Disconnects R2IN (U5, pin 9) to the serial socket, pin 7.	-
R74	Connects SHDN (U5, pin 20) to Ground, causing U5 to enter a state of shutdown.	Disconnects SHDN (U5, pin 20) from Ground.	-
R76	Connects EN (U5, pin 1) to Board_VCC.	Disconnects EN (U5, pin 1) from Board_VCC.	-
R77	Connects T1IN (U5, pin 13) to the header JA6, pin 5.	Disconnects T1IN (U5, pin 13) from the header JA6, pin 5.	-
R78	Connects R1OUT (U5, pin 15) to the header JA6, pin 6.	Disconnects R1OUT (U5, pin 15) from the header JA6, pin 6.	-
R84	Connects RXD2-A (MCU, pin 27) to the RS232 transceiver (U5, pin 10).	Disconnects RXD2-A (MCU, pin 27) from the RS232 transceiver (U5, pin 10).	-
R83	Connects TXD2-A (MCU, pin 28) to the RS232 transceiver U5, pin 12.	Disconnects TXD2-A (MCU, pin 28) from the RS232 transceiver (U5, pin 12).	-
R100	Connects RXD0 (MCU, pin 34) to the RS232 transceiver (U5, pin 15) bypassing J11.	Disconnects RXD0 (MCU, pin 34) from the RS232 transceiver (U5, pin 15).	R114, R115, R116, J11
R103	Connects TXD0 (MCU, pin 33) to the RS232 transceiver (U5, pin 13) bypassing J10.	Disconnects TXD0 (MCU, pin 33) from the RS232 transceiver (U5, pin 10).	R112, J10
R112	Connects TXD0 (MCU, pin 33) to the RS232 transceiver (U5, pin 13) via J10.	Disconnects TXD0 (MCU, pin 33) from the RS232 transceiver (U5, pin 13) via J10.	R113, R103, J10
R115	Connects RXD0 (MCU, pin 34) to the RS232 transceiver (U5, pin 15) via J11.	Disconnects RXD0 (MCU, pin 34) from the RS232 transceiver (U5, pin 15) via J11.	R114, R116, R100, R78, J11

Table 6-4: RS232 Serial Port Option Links

Table 6-5 below details the different configurations and functions of the RS232 serial jumpers.

Reference	Position One	Position Two	Position Three	Related Ref.
J10*	<b>Pins 1 and 2 shorted.</b> <b>Connects TXD0 (MCU, pin B2) to the RS232 transceiver (U5, pin 13).</b>	Pins 2 and 3 shorted. Connects TXD1 (MCU, pin B2) to the RS232 transceiver (U5, pin 13).	<b>All pins open.</b> <b>Disconnects TXD0 and TXD1 from the RS232 transceiver (U5, pin 13). R103 defaults the setting to position one.</b>	R103
J11*	<b>Pins 1 and 2 shorted.</b> <b>Connects RXD0 (MCU, pin B6) to the RS232 transceiver (U5, pin 15).</b>	Pins 2 and 3 shorted. Connects RXD1 (MCU, pin B6) to the RS232 transceiver (U5, pin 15).	<b>All pins open.</b> <b>Disconnects RXD0 and RXD1 from the RS232 transceiver (U5, pin 15). R100 defaults the setting to position one.</b>	R100

Table 6-5: RS232 Serial Port Jumpers

\* By default, this jumper is not fitted to the RSK. R103 is fitted by default and TXD0 is connected to RS232 transceiver.

\*By default, this jumper is not fitted to the RSK. R100 is fitted by default and RXD0 is connected to RS232 transceiver.

## 6.5 LIN Configuration

Table 6-6 below details the function of the option links associated with LIN configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R129	<b>Connects IO3_LTX_CTX-B (MCU, pin 65) to header U6, pin 4.</b>	Disconnects IO3_LTX_CTX-B (MCU, pin 65) from header U6, pin 4.	R128, R130
R132	<b>Connects IO2_LRX_CRX-B (MCU, pin 66) to CAN transceiver (U6, pin 1).</b>	Disconnects IO2_LRX_CRX-B (MCU, pin 66) from CAN transceiver (U6, pin 1).	R131, R133,
R145	<b>Configures the module in master mode.</b> <b>[R146 must also be fitted]</b>	Configures the module in slave mode. [R146 must also be removed]	R146
R146	<b>Configures the module in master mode.</b> <b>[R145 must also be fitted]</b>	Configures the module in slave mode. [R145 must also be removed]	R145

Table 6-6: LIN Option Links

Table 6-7 below details the different configurations and functions of the LIN jumpers.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
J12*	Connects Board_5V to BAT.	<b>Disconnects Board_5V from BAT.</b>	R183

Table 6-7: LIN Port Jumpers

\* By default, this jumper is not fitted to the RSK. R183 is fitted by default and Board\_5V is connected to BAT transceiver.

## 6.6 CAN Configuration

Table 6-8 below details the function of the option links associated with CAN configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R108	Connects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) to CRX-A (U7, pin 4).	Disconnects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) from CRX-A (U7, pin 4).	R106, R107
R111	Connects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) to CTX-A (U7, pin 1).	Disconnects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) from CTX-A (U7, pin 1).	R109, R110
R118	Connects MTIOC0D_CANSTBn (MCU, pin 35) to CANSTBn (U7, pin 14).	Disconnects MTIOC0D_CANSTBn (MCU, pin 35) to CANSTBn (U7, pin 14).	R117
R148	Connects CANERRn (MCU, pin 78) to CANERRn (U7, pin 8).	Disconnects CANERRn (MCU, pin 78) from CANERRn (U7, pin 8).	-
R152	Connects WAKE (U7, pin 9) to GROUND.	Disconnects WAKE (U7, pin 9) from GROUND.	-

Table 6-8: CAN Option Links

## 6.7 IRQ & General I/O Pin Configuration

Table 6-9 below details the function of the option links associated with IRQ and general I/O pin configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R85	Connects <b>IRQ3 (MCU, pin 30) to header JA1, pin 23.</b>	Disconnects IRQ3 (MCU, pin 30) to header JA1, pin 23.	<b>R86, R160</b>
R86	Connects MTIOC0A-B (MCU, pin 61) to header JA1, pin 23.	<b>Disconnects MTIOC0A-B (MCU, pin 61) from header JA1, pin 23.</b>	<b>R85, R169</b>
R91	Connects <b>IRQ2-A (MCU, pin 9) to header JA2, pin 23.</b>	Disconnects IRQ2-A (MCU, pin 9) from header JA2, pin 23.	<b>R92, R172</b>
R92	Connects MTIOC1A (MCU, pin 36) to header JA2, pin 23.	<b>Disconnects MTIOC1A from header JA2, pin 23.</b>	<b>R91, R172</b>
R93	Connects <b>IRQ6 to header JA5 pin 9.</b>	Disconnects IRQ6 from header JA5, pin 9.	<b>R94, R95</b>
R94	Connects MTIOC2A to header JA5, pin 9.	<b>Disconnects MTIOC2A from header JA5, pin 9.</b>	<b>R93, R95</b>
R95	Connects MTIOC0B-B (MCU, pin 63) to header JA5, pin 9.	<b>Disconnects MTIOC0B-B (MCU, pin 63) from header JA5, pin 9.</b>	<b>R93, R94</b>
R96	Connects <b>IRQ7 to header JA5, pin 10.</b>	Disconnects IRQ7 from header JA5, pin 10.	<b>R97</b>
R97	Connects MTIOC0C to header JA5, pin 10.	<b>Disconnects MTIOC0C from header JA5, pin 10.</b>	<b>R96</b>
R104	Connects TRDATA1_SCK2-A (MCU, pin 26) to TRDATA1.	<b>Disconnects TRDATA1_SCK2-A (MCU, pin 26) from TRDATA1.</b>	<b>R105</b>
R105	Connects <b>TRDATA1_SCK2-A (MCU, pin 26) to SCK2-A.</b>	Disconnects TRDATA1_SCK-A (MCU, pin 26) from SCK2-A.	<b>R104</b>
R106	Connects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) to TRDATA0.	<b>Disconnects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) from TRDATA0.</b>	<b>R107, R108</b>
R107	Connects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) to RXD2-A.	<b>Disconnects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) from RXD2-A.</b>	<b>R106, R108</b>
R108	Connects <b>TRDATA0_RXD2-A_CRX-A (MCU, pin 27) to CRX-A (U7, pin 4)</b>	Disconnects TRDATA0_RXD2-A_CRX-A (MCU, pin 27) to CRX-A (U7, pin 4)	<b>R106, 107</b>
R109	Connects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) to TRSYNCn.	<b>Disconnects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) from TRSYNCn.</b>	<b>R110, R111</b>
R110	Connects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) to TXD2-A	<b>Disconnects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) from TXD2-A</b>	<b>R109, R111</b>
R111	Connects <b>TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) to CTX-A (U7, pin 1).</b>	Disconnects TRSYNCn_TXD2-A_CTX-A (MCU, pin 28) from CTX-A (U7, pin 1).	<b>R110, R111</b>

Table 6-9: IRQ & General I/O Option Links (Continued Overleaf)

**Table 6-9** below details the function of the option links associated with IRQ and general I/O pin configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R112	<b>Connects TXD0_SDA (MCU, pin 33) to TXD0 (U5, pin 13), via J10.</b>	Disconnects TXD0_SDA (MCU, pin 33) from TXD0 (U5, pin 13), via J10.	<b>R113</b>
R113	Connects TXD0_SDA (MCU, pin 33) to SDA.	<b>Disconnects TXD0_SDA (MCU, pin 33) from SDA.</b>	<b>R112</b>
R114	Connects MTIOC0C_RXD0_SCL (MCU, pin 34) to MTIOC0C	<b>Disconnects MTIOC0C_RXD0_SCL (MCU, pin 34) from MTIOC0C.</b>	<b>R115, R116, R97, R172</b>
R115	<b>Connects MTIOC0C_RXD0_SCL (MCU, pin 34) to RXD0 (U5, pin 15) via J11.</b>	Disconnects MTIOC0C_RXD0_SCL (MCU, pin 34) from RXD0 (U5, pin 15) via J11.	<b>R114, R116</b>
R116	Connects MTIOC0C_RXD0_SCL (MCU, pin 34) to SCL	<b>Disconnects MTIOC0C_RXD0_SCL (MCU, pin 34) from SCL</b>	<b>R114, R115</b>
R117	Connects MTIOC0D_CANSTBn (MCU, pin 35) to MTIOC0D.	<b>Disconnects MTIOC0D (MCU, pin 35) from MTIOC0D.</b>	<b>R118</b>
R118	<b>Connects MTIOC0D_CANSTBn (MCU, pin 35) to CANSTBn (U7, pin 14).</b>	Disconnects MTIOC0D_CANSTBn from CANSTBn (U7, pin 7).	<b>R117</b>
R119	Connects IO7_MTI0C2A (MCU, pin 38) to IO7.	<b>Disconnects IO7_MTI0C2A (MCU, pin 38) from IO7.</b>	<b>R120</b>
R120	<b>Connects IO7_MTI0C2A (MCU, pin 38) to MTI0C2A</b>	Disconnects IO7_MTI0C (MCU, pin 38) from MTI0C2A	<b>R119, R94</b>
R121	Connects IO6_MTI0C2B_LINNSLP (MCU, pin 39) to IO6.	<b>Disconnects IO6_MTI0C2B_LINNSLP (MCU, pin 39) from IO6.</b>	<b>R122, R123</b>
R122	Connects IO6_MTI0C2B_LINNSLP (MCU, pin 39) to MTI0C2B.	<b>Disconnects IO6_MTI0C2B_LINNSLP (MCU, pin 39) from MTI0C2B.</b>	<b>R121, R123</b>
R123	<b>Connects IO6_MTI0C2B_LINNSLP (MCU, pin 39) to LINNSLP (U6, pin 2).</b>	Disconnects IO6_MTI0C2B_LINNSLP (MCU, pin 39) from LINNSLP (U6, pin 2).	<b>R121, R122</b>
R124	<b>Connects IO5_MTI0C6A (MCU, pin 40) to IO5.</b>	Disconnects IO5_MTI0C6A (MCU, pin 40) from IO5.	<b>R125</b>
R125	Connects IO5_MTI0C6A (MCU, pin 40) to MTI0C6A.	<b>Disconnects IO5_MTI0C6A (MCU, pin 40) from MTI0C6A</b>	<b>R124</b>
R126	<b>Connects IO4_MTI0C6C (MCU, pin 41) to IO4.</b>	Disconnects IO4_MTI0C6C (MCU, pin 41).	<b>R127</b>
R127	Connects IO4_MTI0C6C (MCU, pin 41) to MTI0C6C.	<b>Disconnects IO4_MTI0C6C (MCU, pin 41) from MTI0C6C.</b>	<b>R126</b>
R128	Connects IO3_LTX_CTX-B (MCU, pin 65) to IO3	<b>Disconnects IO3_LTX_CTX-B (MCU, pin 65) from IO3</b>	<b>R129, R130</b>
R129	<b>Connects IO3_LTX_CTX-B (MCU, pin 65) to LTX (U6, pin 4).</b>	<b>Disconnects IO3_LTX_CTX-B (MCU, pin 65) from LTX (U6, pin 4).</b>	<b>R128, R130</b>
R130	Connects IO3_LTX_CTX-B (MCU, pin 65) to CTX-B.	<b>Disconnects IO3_LTX_CTX-B (MCU, pin 65) from CTX-B.</b>	<b>R128, R129</b>

**Table 6-9: IRQ & General I/O Option Links (Continued Overleaf)**

Table 6-9 below details the function of the option links associated with IRQ and general I/O pin configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R131	Connects IO2_LR_X_CRX-B (MCU, pin 66) to IO2.	<b>Disconnects IO2_LR_X_CRX-B (MCU, pin 66) from IO2.</b>	R132, R133, R33
R132	<b>Connects IO2_LR_X_CRX-B (MCU, pin 66) to LRX (U6, pin 1).</b>	Disconnects IO2_LR_X_CRX-B (MCU, pin 66) from LRX (U6, pin 1).	R131, R133, R33
R133	Connects IO2_LR_X_CRX-B (MCU, pin 66) to CRX-B.	<b>Disconnects IO2_LR_X_CRX-B (MCU, pin 66) from CRX-B.</b>	R131, R132, R33
R134	<b>Connects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) to IO1.</b>	Disconnects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) from IO1.	R135, R136
R135	Connects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) to MTCLKA-B.	<b>Disconnects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) from MTCLKA-B.</b>	R134, R136
R136	Connects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) to IRQ6.	<b>Disconnects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) from IRQ6.</b>	R134, R135, R93
R137	<b>Connects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) to IO0.</b>	Disconnects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) from IO0.	R138, R139
R138	Connects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) to MTCLKB-B.	<b>Disconnects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) from MTCLKB-B.</b>	R137, R139
R139	Connects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) to IRQ7.	<b>Disconnects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) from IRQ7.</b>	R137, R139
R168	<b>Connects IRQ0-B (MCU, pin 1) to header JA2, pin 7.</b>	Disconnects IRQ0-B (MCU, pin 1) from header JA2, pin 7.	R169, R30
R169	Connects MTIOC0A-B (MCU, pin 61) to header JA2, pin 7.	<b>Disconnects MTIOC0A-B (MCU, pin 61) from header JA2, pin 7.</b>	R168
R170	<b>Connects IRQ1-B (MCU, pin 8) to header JA2, pin 9.</b>	Disconnects IRQ1-B (MCU, pin 8) from header JA2, pin 9.	R171, R166, R31
R171	Connects MTIOC0B-B (MCU, pin 63) to header JA2, pin 9.	<b>Disconnects MTIOC0B-B (MCU, pin 63) from header JA2, pin 9.</b>	R170
R172	Connects MTIOC0C to header JA2, pin 23	<b>Disconnects MTIOC0C from header JA2, pin 23.</b>	R91, R92

Table 6-9: IRQ & General I/O Option Links (Continuation)

## 6.8 Multi-Function Timer Pulse Unit (MTU) Configuration

Table 6-10 detail the function of option links related to configuring the MCU's MTU pins.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R114	Connects MTIOC0C_RXD0_SCL (MCU, pin 34) to MTIOC0C.	Disconnects MTIOC0C (MCU, pin 34) from MTIOC0C.	R115, R116
R117	Connects MTIOC0D_CANSTBn (MCU, pin 35) to MTIOC0D.	Disconnects MTIOC0D_CANSTBn (MCU, pin 35) from MTIOC0D.	R118
R120	Connects IO7_MTI0C2A (MCU, pin 38) to MTIOC2A.	Disconnects IO7_MTI0C2A (MCU, pin 38) from MTIOC2A.	R119
R122	Connects IO6_MTI0C2B_LINNSLP (MCU, pin 39) to MTIOC2B.	Disconnects IO6_MTI0C2B_LINNSLP (MCU, pin 39) from MTIOC2B.	R121, R123
R125	Connects IO5_MTI0C6A (MCU, pin 40) to MTIOC6A.	Disconnects IO5_MTI0C6A (MCU, pin 40) from MTIOC6A.	R124
R127	Connects IO4_MTI0C6C (MCU, pin 41) to MTIOC6C.	Disconnects IO4_MTI0C6C (MCU, pin 41) from MTIOC6C.	R126
R135	Connects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) from MTIOCLKA-B.	Disconnects IO1_MTCLKA-B_IRQ6 (MCU, pin 67) from MTIOCLKA-B.	R134, R136
R138	Connects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) to MTIOCLKB-B.	Disconnects IO0_MTCLKB-B_IRQ7 (MCU, pin 68) from MTIOCLKB-B.	R137, R139

Table 6-10: MTU Option Links

## 6.9 Power Supply Configuration

Table 6-11 below details the function of the option links associated with power supply configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R24	Connects Board_VCC to the PWR connector, pin 3.	Disconnects Board_VCC from the PWR connector, pin 3.	-
R25	Connects CON_5V to Board_VCC via R101, bypassing J14.	Disconnects CON_5V from Board_VCC via R101.	R101, J14
R26	Connects UC_VCC to Board_VCC, bypassing J5.	Disconnects UC_VCC from Board_VCC.	J5
R99	Connects CON_3V3 to Board_VCC.	Disconnects CON_3V3 from Board_VCC.	-
R101	Connects Board_5V to Board_VCC, bypassing J14.	Disconnects Board_5V from Board_VCC.	J14
R140	Connects Unregulated_VCC to Board_VCC.	Disconnects Unregulated_VCC from Board_VCC.	R24

Table 6-11: Power Supply Option Links

**Table 6-12** below details the different configurations and functions of the Power Supply jumpers.

Reference	Position One	Position Two	Position Three	Related Ref.
J5*	Pins 1 and 2 shorted. Connects UC_VCC to Board_VCC, bypassing R26.	All pins open. Disconnects UC_VCC from Board_VCC.	-	R26
J13*	Pins 1 and 2 shorted. Connects 3.3V regulator (U8) to Board_VCC.	All pins open. Disconnects the 3.3V regulator (U8) from Board_VCC.	-	R177, J14
J14*	Pins 1 and 2 shorted. Connects Board_5V and CON_5V to Board_VCC.	Pins 2 and 3 shorted. Connects Board_5V and CON_5V to the 3.3V regulator (U8), bypassed by R101.	All pins open. Disconnects Board_5V and CON_5V from Board_VCC, bypassed by R101.	R101, J13

**Table 6-12: Power Supply Jumpers**

\*By default, this jumper is not fitted to the RSK. The default position is therefore all pins open.

\*By default, this jumper is not fitted to the RSK. R26 is fitted by default and UC\_VCC is connected to Board\_VCC.

\*By default, this jumper is not fitted to the RSK. R101 is fitted by default and Board\_5V and CON\_5V are connected to Board\_VCC.

## 6.10 Clock Configuration

**Table 6-13** below details the function of the option links associated with clock configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R3	Connects XTAL (MCU, pin 11) to the crystal X1.	Disconnects XTAL (MCU, pin 11) from the crystal X1.	R4, R9
R4	Connects EXTAL (MCU, pin 13) to the crystal X1.	Disconnects EXTAL (MCU, pin 13) from the crystal X1.	R3, R8
R6	Connects EXTAL (MCU, pin 13) to the crystal X2.	Disconnects EXTAL (MCU, pin 13) from the crystal X2.	R7, R9
R7	Connects XTAL (MCU, pin 11) to the crystal X2.	Disconnects XTAL (MCU, pin 11) from the crystal X2.	R6, R8
R8	Connects EXTAL (MCU, pin 13) to CON_EXTAL (JA2, pin 2).	Disconnects EXTAL (MCU, pin 13) to CON_EXTAL (JA2, pin 2).	R3, R6
R9	Connects XTAL (MCU, pin 11) to CON_XTAL (J1, pin 11).	Disconnects XTAL (MCU, pin 11) to CON_XTAL (J1, pin 11).	R4, R7

**Table 6-13: Clock Option Links**

## 7. Headers

### 7.1 Application Headers

This RSK is fitted with application headers, which can be used to connect compatible Renesas application devices or as easy access to MCU pins.

**Table 7-1** below lists the connections of the application header, JA1.

Application Header JA1					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	5V	-	2	0V	-
3	3V3	-	4	0V	-
5	AVCC	92	6	AVSS	95
7	AVREF	93	8	ADTRG	37
9	AD0	91	10	AD1	90
11	AD2	89	12	AD3	88
13	DA0	NC	14	DA1	NC
15	IO_0	68	16	IO_1	67
17	IO_2	66	18	IO_3	65
19	IO_4	41	20	IO_5	40
21	IO_6	39	22	IO_7	38
23	IRQ3/M2_H SIN0	30/NC/61	24	IIC_EX	NC
25	IIC_SDA	33	26	IIC_SCL	34

**Table 7-1: Application Header JA1 Connections**

**Table 7-2** below lists the connections of the application header, JA2.

Application Header JA2					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	RESET	10	2	EXTAL	13
3	NMI	15	4	Vss1	-
5	WDT_OVF	-	6	SCIaTX	33
7	IRQ0/M1_H SIN0	1/NC/61	8	SCIaRX	34
9	IRQ1/M1_H SIN1	8/63	10	SCIaCK	32
11	M1_UD	59	12	CTSRTS	NC
13	M1_Up	56	14	M1_UN	53
15	M1_Vp	55	16	M1_Vn	52
17	M1_Wp	54	18	M1_Wn	51
19	TimerOut	35	20	TimerOut	39
21	TimerIn	99	22	TimerIn	100
23	IRQ2/M1_EncZ/M1_H SIN2	9/36/34	24	M1_POE	57
25	M1_TRCCLK	67	26	M1_TRDCLK	68

**Table 7-2: Application Header JA2 Connections**

Table 7-3 below lists the connections of the application header, JA5.

Application Header JA5					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	AD4	87	2	AD5	86
3	AD6	85	4	AD7	84
5	CAN1TX	65	6	CAN1RX	66
7	CAN2TX	NC	8	CAN2RX	NC
9	IRQ4/M2_EncZ/M2_H SIN1	67/38/63	10	IRQ5/M2_H SIN2	68/34
11	M2_UD	41	12	M2_Uin	96
13	M2_Vin	97	14	M2_Win	98
15	M2_Toggle	40	16	M2_POE	43
17	M2_TRCCLK	99	18	M2_TRDCLK	100
19	M2_UP	45	20	M2_UN	48
21	M2_VP	46	22	M2_VN	49
23	M2_WP	47	24	M2_WN	50

Table 7-3: Application Header JA5 Connections

Table 7-4 below lists the connections of the application header, JA6.

Application Header JA6					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	DREQ	NC	2	DACK	NC
3	TEND	NC	4	STBYn	NC
5	RS232TX	NC	6	RS232RX	NC
7	SCl bRX	20	8	SCl bTX	22
9	SCl cTX	28	10	SCl bCK	21
11	SCl cCK	26	12	SCl cRX	27
13	M1_Toggle	58	14	M1_Uin	96
15	M1_Vin	97	16	M1_Win	98
17	Reserved	NC	18	Reserved	NC
19	Reserved	NC	20	Reserved	NC
21	Reserved	NC	22	Reserved	NC
23	Unregulated_VCC	-	24	Vss	-

Table 7-4: Application Header JA6 Connections

## 7.2 Microcontroller Ring Headers

Table 7-5 below lists the connections of the microcontroller pin header, J1.

Microcontroller Pin Header, J1					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	IRQ0-B	1	2	EMLE	2
3	GROUND	3/12/44/62	4	MDE	4
5	-	-	6	MD1	6
7	MD0	7	8	IRQ1-B	8
9	IRQ2-A	9	10	RESn	10
11	CON_XTAL	11	12	GROUND	12/3/44/62
13	CON_EXTAL	13	14	UC_VCC	14/42/60
15	NMIIn	15	16	DLCDRS	16
17	DLCDE	17	18	TRSTn	18
19	TMS	19	20	TDI_RXD1	20
21	TCK_SCK1	21	22	TDO_TXD1	22
23	TRCLK	23	24	TRDATA3	24
25	TRDATA2	25	26	NC	
27	NC		28	NC	
29	NC		30	NC	
31	NC		32	NC	
33	NC		34	NC	
35	NC		36	NC	

**Table 7-5: Microcontroller Pin Header, J1**

**Table 7-6** below lists the connections of the microcontroller pin header, J2.

Microcontroller Pin Header, J2					
Pin	Circuit Net name	MCU Pin	Pin	Circuit Name	MCU Pin
1	TRDATA1_SCK2-A	26	2	TRDATA0_RXD2-A_CRX-A	27
3	TRSYNCn_TXD2-A_CTX-A	28	4	NC	-
5	IRQ3	30	6	NC	-
7	SCK0	32	8	TXD0_SDA	33
9	MTIOC0C_RXD0_SCL	34	10	MTIOC0D_CANSTBn	35
11	MTIOC1A	36	12	ADTRG0n-A	37
13	IO7_MTIIOC2A	38	14	IO6_MTIIOC2B_LINNSLP	39
15	IO5_MTCIO6A	40	16	IO4_MTIIOC6C	41
17	UC_VCC	14/42/60	18	POE4n	43
19	GROUND	3/12/44/62	20	MTIOC6B	45
21	MTIOC7A	46	22	MTIOC7B_DLCDD7	47
23	MTIOC6D_DLCDD6	48	24	MTIOC7C_DLCDD5	49
25	MTIOC7D_DLCDD4	50	26	NC	-
27	NC	-	28	NC	-
29	NC	-	30	NC	-
31	NC	-	32	NC	-
33	NC	-	34	NC	-
35	NC	-	36	NC	-

**Table 7-6: Microcontroller Pin Header, J2**

Table 7-7 below lists the connections of the microcontroller pin header, J3.

Microcontroller Pin Header J3					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	MTIOC4D	51	2	MTIOC4C	52
3	MTIOC3D	53	4	MTIOC4B_LED2	54
5	MTIOC4A_LED1	55	6	MTIOC3B_LED0	56
7	POE0n	57	8	MTIOC3A_LED3	58
9	MTIOC3C	59	10	UC_VCC	14/42/60
11	MTIOC0A-B	61	12	GROUND	3/12/44/62
13	MTIOC0B-B	63	14	CANEN	64
15	IO3_LTX_CTX-B	65	16	IO2_LRX_CRX-B	66
17	IO1_MTCLKA-B_IRQ6	67	18	IO0_MTCLKB-B_IRQ7	68
19	PIN69	69	20	PIN70	70
21	CON_AVCC	-	22	CON_VREF	-
23	CON_AVSS	-	24	PIN74	74
25	PIN75	75	26	NC	-
27	NC	-	28	NC	-
29	NC	-	30	NC	-
31	NC	-	32	NC	-
33	NC	-	34	NC	-
35	NC	-	36	NC	-

Table 7-7: Microcontroller Pin Header, J3

**Table 7-8** below lists the connections of the microcontroller pin header, J4.

Microcontroller Pin Header J4					
Pin	Circuit Net Name	MCU Pin	Pin	Circuit Net Name	MCU Pin
1	PIN76	76	2	ADPOT	77
3	CANERRn	78	4	PIN79	79
5	PIN80	80	6	PIN81	81
7	PIN82	82	8	PIN83	83
9	AN103	84	10	AN102	85
11	AN101	86	12	AN100	87
13	AN003	88	14	AN002	89
15	AN001	90	16	AN000	91
17	CON_AVCC0	-	18	CON_VREFH0	-
19	CON_VREFL0	-	20	CON_AVSS0	-
21	MTIC5U	96	22	MTIC5V	97
23	MTIC5W	98	24	MTCLKC-B	99
25	MTCLKD-B	100	26	NC	-
27	NC	-	28	NC	-
29	NC	-	30	NC	-
31	NC	-	32	NC	-
33	NC	-	34	NC	-
35	NC	-	36	NC	-

**Table 7-8: Microcontroller Pin Header, J4**

## 8. Code Development

### 8.1 Overview

For all code debugging using Renesas software tools, the RSK board must be connected to a PC via an E1/E20 debugger. An E1 debugger is supplied with this RSK product.

For further information regarding the debugging capabilities of the E1/E20 debuggers, refer to the RX Family E1/E20 Emulator User's Manual (REJ10J2089).

### 8.2 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 128k code and data. To use the compiler with programs greater than this size you need to purchase the full tools from your distributor.

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.

### 8.3 Mode Support

The MCU supports Single Chip, Boot and USB Boot modes, which are configured on the RSK board. Details of the modifications required can be found in §6. All other MCU operating modes are configured within the MCU's registers, which are listed in the RX62T group hardware manual.

Only ever change the MCU operating mode whilst the RSK is in reset, or turned off; otherwise the MCU may become damaged as a result.

### 8.4 Debugging Support

The E1 emulator (as supplied with this RSK) supports break points, event points (including mid-execution insertion) and basic trace functionality. It is limited to a maximum of 8 on-chip event points, 256 software breaks and 256 branch/cycle trace. For further details, refer RX Family E1/E20 Emulator User's Manual (REJ10J2089).

### 8.5 Address Space

Figure 8-1 below details the address space of MCU in its different operating modes. For further details, refer to the RX62T group hardware manual.

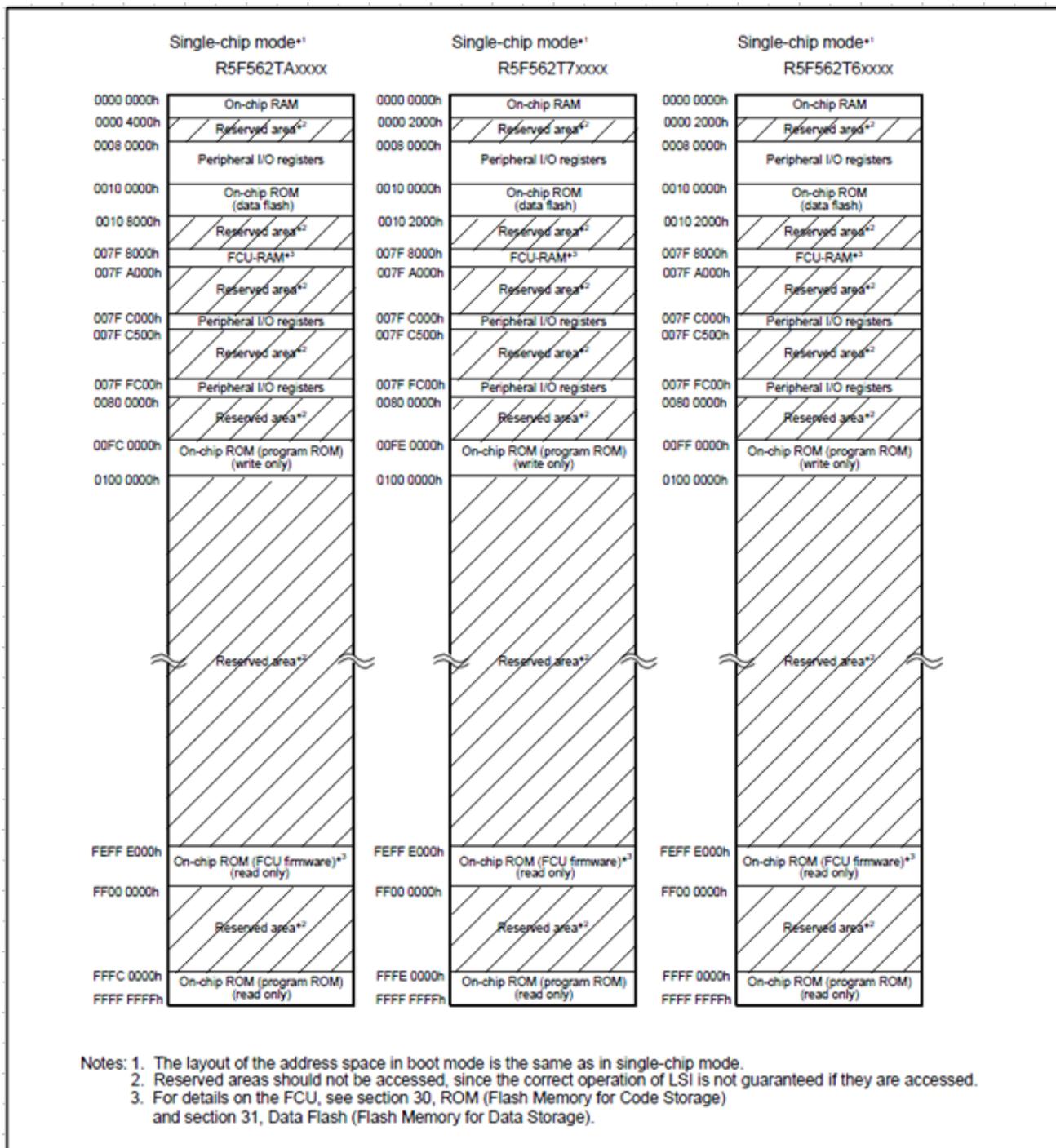


Figure 8-1: MCU Address Space Diagram

## 9. Additional Information

### Technical Support

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 RX62T series microcontrollers refer to the RX62T Group hardware manual.

For information about the RX62T assembly language, refer to the RX600 Series Software Manual.

Online technical support and information is available at: <http://www.renesas.com/rskrx62t>

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General information on Renesas Microcontrollers can be found on the Renesas website at:

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