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RX63T Group

Renesas Starter Kit User's Manual
For e²studio

RENESAS MCU
RX Family / RX600 Series

Renesas Electronics
www.renesas.com

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Disclaimer

By using this Renesas Starter Kit (RSK), the user accepts the following terms:

The RSK is not guaranteed to be error free, and the entire risk as to the results and performance of the RSK is assumed by the User. The RSK is provided by Renesas on an "as is" basis without warranty of any kind whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, title and non-infringement of intellectual property rights with regard to the RSK. Renesas expressly disclaims all such warranties. Renesas or its affiliates shall in no event be liable for any loss of profit, loss of data, loss of contract, loss of business, damage to reputation or goodwill, any economic loss, any reprogramming or recall costs (whether the foregoing losses are direct or indirect) nor shall Renesas or its affiliates be liable for any other direct or indirect special, incidental or consequential damages arising out of or in relation to the use of this RSK, even if Renesas or its affiliates have been advised of the possibility of such damages.

Precautions

The following precautions should be observed when operating any RSK product:

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 RX63T 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.	RSKRX63T User Manual for e^{2}studio	R20UT1968EG
Tutorial Manual	Provides a guide to setting up RSK environment, running sample code and debugging programs.	RSKRX63T Tutorial Manual for e^{2}studio	R20UT1969EG
Quick Start Guide	Provides simple instructions to setup the RSK and run the first sample, on a single A4 sheet.	RSKRX63T Quick Start Guide for e^{2}studio	R20UT1970EG
Schematics	Full detail circuit schematics of the RSK.	RSKRX63T Schematics	R20UT0956EG
Hardware Manual	Provides technical details of the RX63T microcontroller.	RX63T Group Hardware Manual	R01UH0238EJ

2. List of Abbreviations and Acronyms

Abbreviation	Full Form
ADC	Analog-to-Digital Converter
DIP	Dual In-line Package
E1	On-chip Debugger
ESD	Electrostatic Discharge
IIC	Philips™ Inter-Integrated Circuit Connection Bus
IRQ	Interrupt Request
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LIN	Local Interconnect Network
MCU	Micro-controller Unit
NMI	Non Maskable Interrupt
PC	Personal Computer
RSK	Renesas Starter Kit

Table of Contents

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.

Details of the external power supply requirements for the RSK, and connections are shown in **Table 2-1** below.

Connector	Supply Voltages
PWR	Regulated, 5V DC

Table 2-1: Main Power Supply Requirements

In order for the debug LCD to operate, the following jumper settings must be made for the different power supply options:

Jumper	RSK Powered By E1 Debugger	RSK Powered by External 5V Supply
J6	Jumper across pins 1 and 2.	Jumper across pins 2 and 3.
J7	Jumper across pins 1 and 2.	Jumper across pins 2 and 3.

Table 2-2: LCD Power Supply Options

The main power supply connected to PWR should supply a minimum of 5W to ensure full functionality.

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.
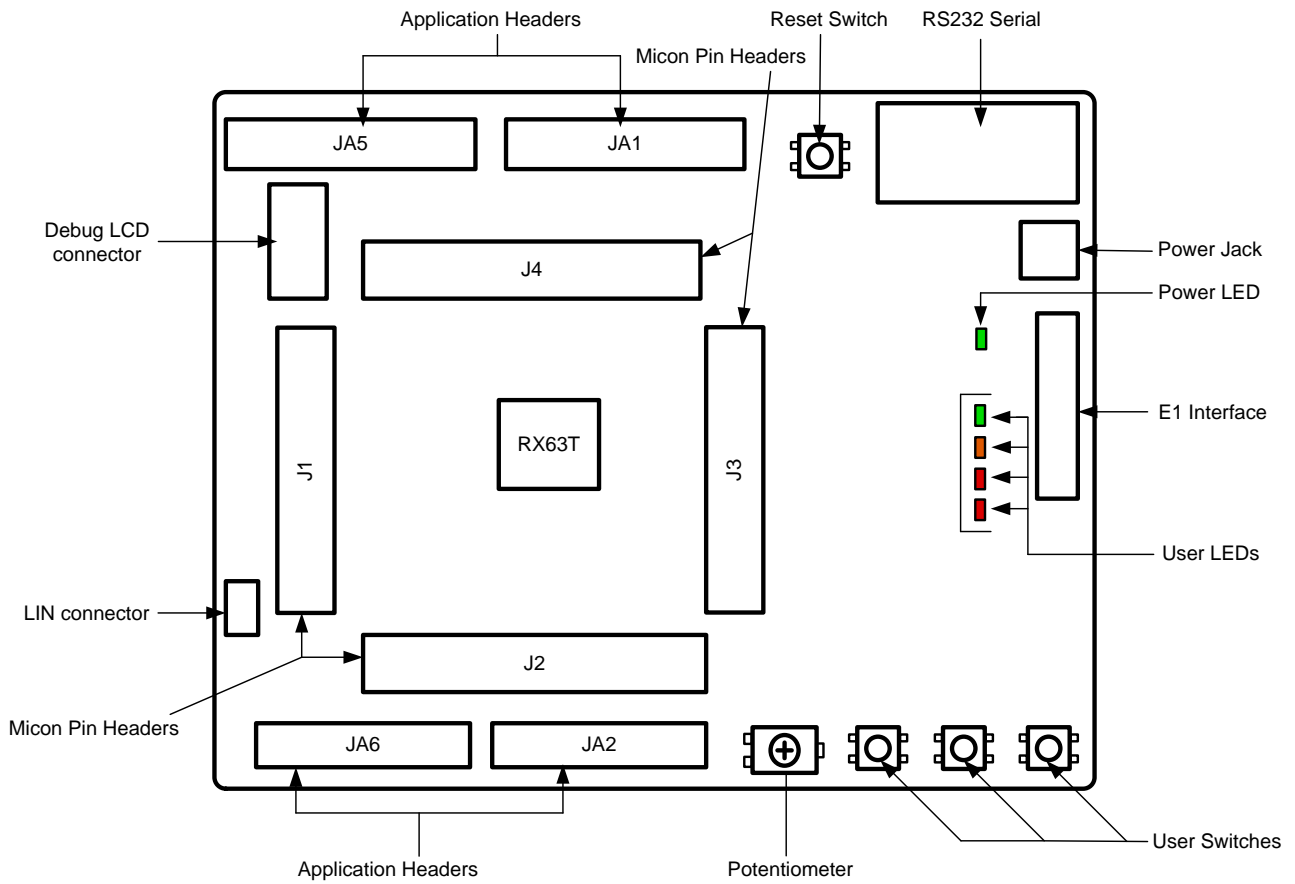
Figure 3-1: Board Layout

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.
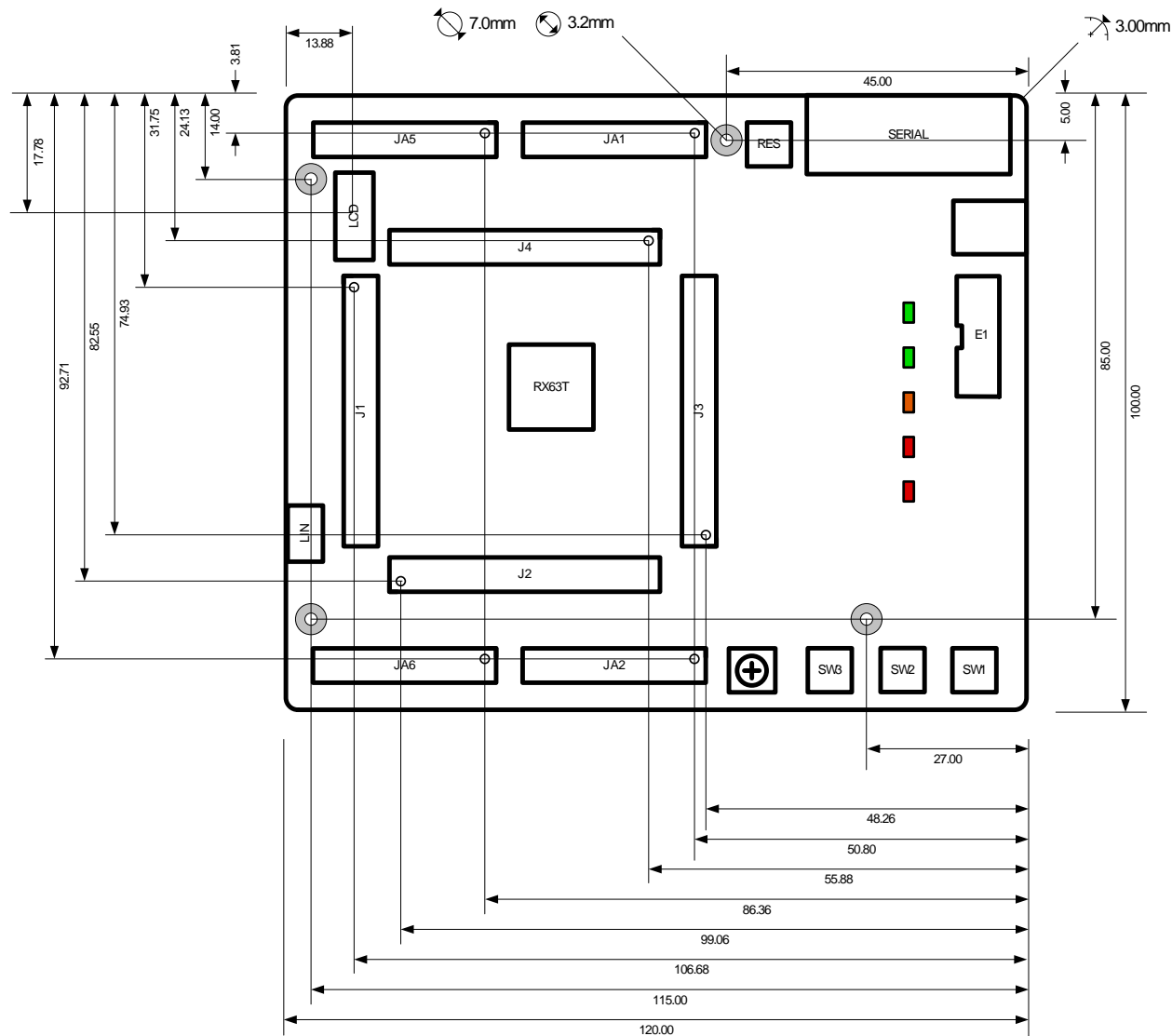
Figure 3-2: Board Dimensions

3.3   Component Placement

Figure 3-3 below shows placement of individual components on the top-side PCB. Component types and values can be looked up using the board schematics.
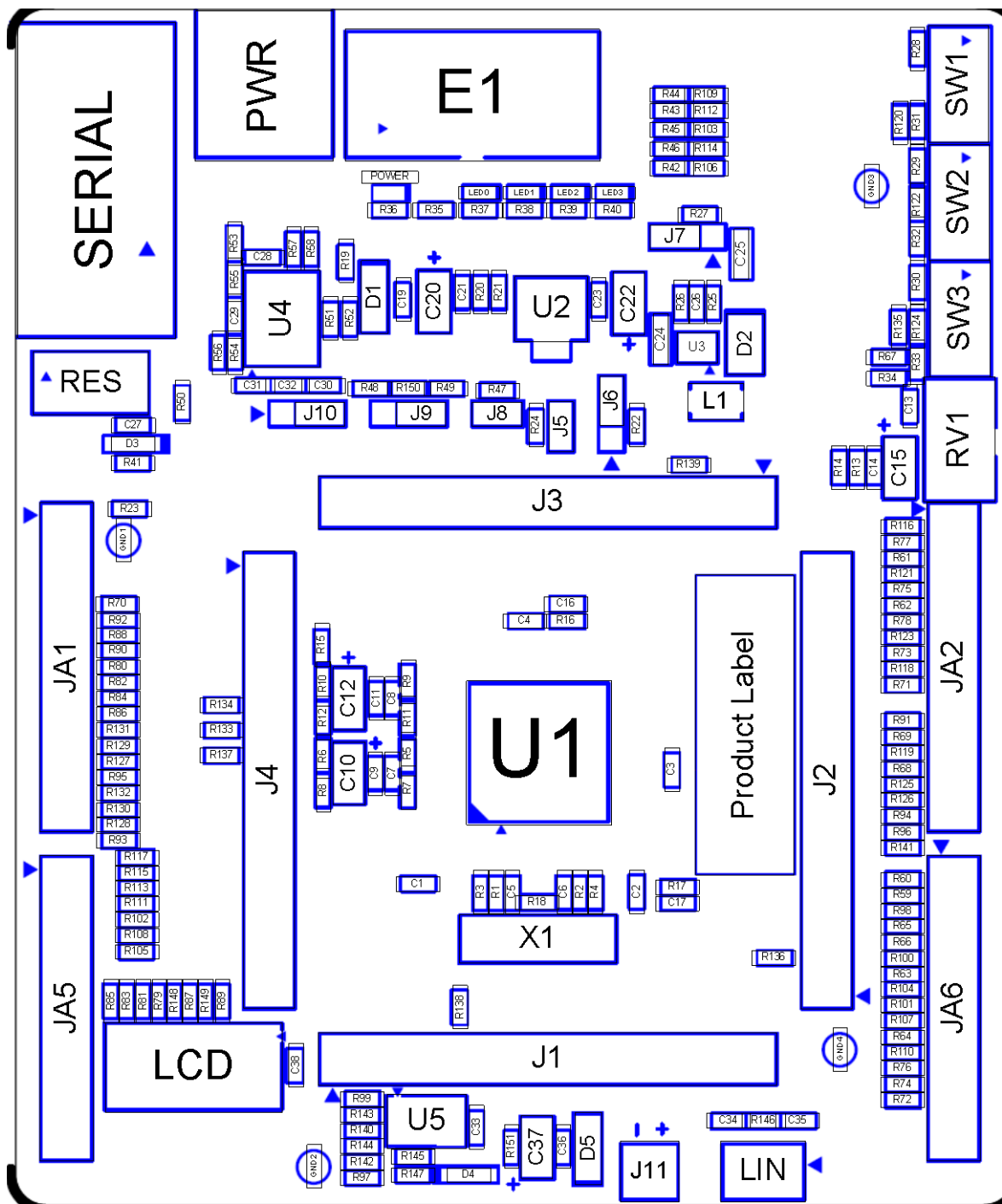
Figure 3-3: Top-Side Component Placement

4. Connectivity

4.1 Internal RSK Connections

The diagram below shows the RSK board components and their connectivity to the MCU.
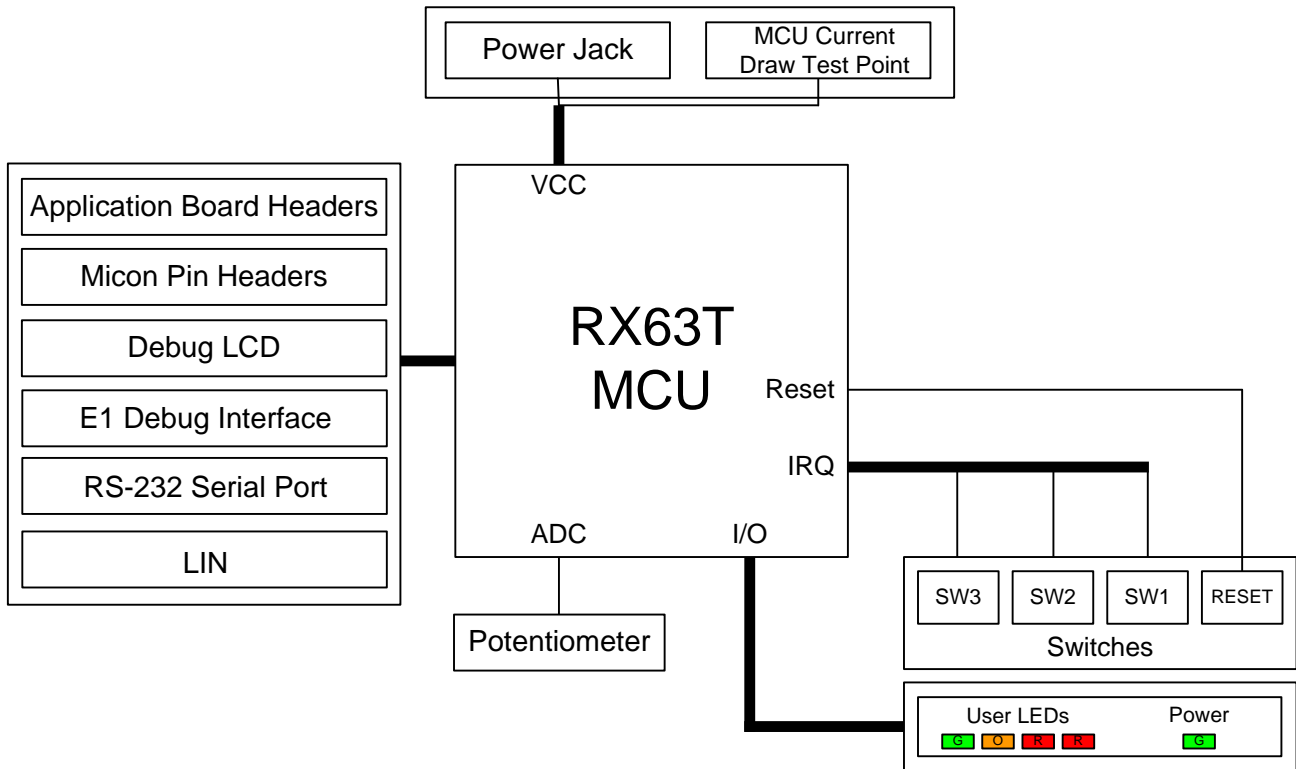
Figure 4-1: Internal RSK Block Diagram

4.2   Debugger Connections

The diagram below shows the connections between the RSK, E1 debugger and the host PC.
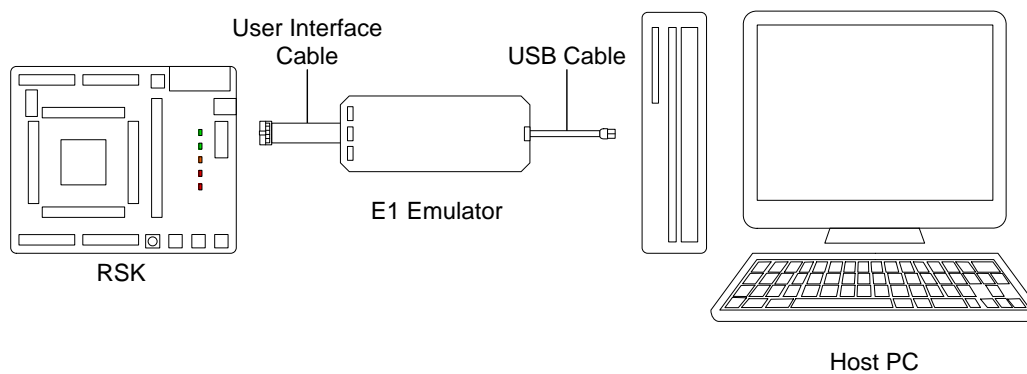
Figure 4-2: Debugger Connection Diagram

5. User Circuitry

5.1   Reset Circuit

A reset control circuit is not fitted to the RSK, as the MCU is capable of voltage and power-on detection. Resets are handled internally, and reset switch is connected directly to RESn on the MCU (pin 6).

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 RX63T hardware manual for details regarding the clock signal requirements, and the RSKRX63T 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 crystal.	Fitted	16MHz	HC49, SMT
X2	External crystal	Not fitted	NA	NA

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 RSKRX63T board schematics.

Switch	Function	MCU Connection
RES	When pressed, the microcontroller is reset.	RESn, Pin 6
SW1	Connects to an IRQ input for user controls.	IRQ0-DS, Pin 62(P10)
SW2	Connects to an IRQ input for user controls.	IRQ1-DS, Pin 61(P11)
SW3/ADTRG	Connects to an IRQ input for user controls. The switch is also connected to an ATRG input, and is used to trigger AD conversions.	IRQ2-DS, Pin 2(P00) and ADTRG0n, Pin 64

Table 5-2: Switch Connections

5.4   LEDs

There are five 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
POWER	Green	Indicates the power status	No connection
LED0	Green	User operated LED.	P71, Pin 38
LED1	Orange	User operated LED.	P72, Pin 37
LED2	Red	User operated LED.	P73, Pin 36
LED3	Red	User operated LED.	P33, Pin 40

Table 5-3: LED Connections

5.5   Potentiometer

A single-turn potentiometer is connected as a potential divider to analog input AN000, pin 56. The potentiometer can be used to create a voltage between AVCC0 and ground (by default, AVCC0 is connected to the board power supply Board_VCC).

The potentiometer is fitted to offer an easy method of supplying a variable analog 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.

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	PA3, pin 27
5	R/W (pulled to ground)	-	6	DLCDE (pulled to ground)	PA2, pin 28
7	No Connection	-	8	No Connection	-
9	No Connection	-	10	No Connection	-
11	DLCDD4	P91, pin 32	12	DLCDD5	P92, pin 31
13	DLCDD6	P93, pin 30	14	DLCDD7	P94, pin 29

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 SCI12 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 **Table 5-5** below.

SCI Signal	Function	MCU Connection	RS232 Connection
TXD0	TXD0 Transmit Signal.	P30, Pin 45	Pin 2
RXD0	RXD0 Receive Signal.	P24, Pin 46	Pin 3
TXD1	TXD1 Transmit Signal.	PD3, Pin 16	Pin 2*
RXD1	RXD1 Receive Signal.	PD5, Pin 14	Pin 3*
TXD12	TXD12 Transmit Signal.	PB5, Pin 19	Pin 8*
RXD12	RXD12 Receive Signal.	PB6, Pin 18	Pin 7*

Table 5-5: Serial Port Connections

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

5.8   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 RX63T hardware manual.

Connections between the LIN connector and the microcontroller are listed in **Table 5-6** below.

LIN Signal	Function	MCU Connection
LINTXD	LIN Transmit Signal	PB5, pin 19
LINRXD	LIN Receive Signal	PB6, pin 18
LINNSLP	LIN Transceiver Device Sleep Control	PB3, pin 23

Table 5-6: 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 or by configuration DIP switches

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, jumpers and DIP switches.

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 some of the MCU's pins are multiplexed, some of the peripherals must be used exclusively. Refer to the RX63T hardware manual and RSKRX63T board schematics for further information.

6.2   MCU Operating Modes

Table 6-1 below details the function of the jumpers associated with the MCU operating modes.

Reference	Position One	Position Two	Position Three	Related Ref.
J8	Fitted. SCI Boot mode	**Removed. Single Chip Mode is selected.**	-	-

Table 6-1: MCU Operating Mode Configuration

Table 6-2 below details the function of the jumpers associated with the emulator.

Reference	Position One	Position Two	Position Three	Related Ref.
J9	Pin 1 and pin 2 shorted (H pin connected to middle pin), E1 debugs with Hot plug-in.	**Pin 2 and pin 3 shorted (L pin connected to middle pin), E1 debugs normally. Microcontroller single operation (without E1)**	All open. DO NOT SET.	-

Table 6-2: Emulator Configuration

6.3   E1 Debugger Interface

Table 6-3 below details the function of the option links associated with the E1 debugger interface configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R106	**Connects TCK/FINEC (MCU, pin 15) to E1 connector (pin 1).**	Disconnects TCK/FINEC (MCU, pin 15) from E1 connector (pin 1).	R107, R108
R112	**Connects TMS (MCU, pin13) to E1 connector (pin 9).**	Disconnects TMS (MCU, pin13) from E1 connector (pin 9).	R113
R114	**Connects TRSTn (MCU, pin12) to E1 connector (pin 3).**	Disconnects TRSTn (MCU, pin12) from E1 connector (pin 3).	R115
R109	**Connects TDI (MCU, pin 15) to E1 connector (pin 11).**	Disconnects TDI (MCU, pin 15) from E1 connector (pin 11).	R110, R111
R103	**Connects TDO (MCU, pin 16) to E1 connector (pin 5).**	Disconnects TDO (MCU, pin 16) from E1 connector (pin 5).	R104, R105
R150	**Connects EMLE (MCU, pin 1) to E1 connector (pin 4).**	Disconnects EMLE (MCU, pin 1) from E1 connector (pin 1).	R104, R105

Table 6-3: E1 Debugger Interface Option Links

6.4   LIN Configuration

Table 6-4 below details the function of the option links associated with the LIN transceiver.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R97	**Connects LINTXD (MCU, pin 19) to TXD (U5, pin 4).**	Disconnects LINTXD (MCU, pin 19) from TXD (U5, pin 4).	R98
R99	**Connects LINRXD (MCU, pin 18) to RXD (U5, pin 1).**	Disconnects LINRXD (MCU, pin 18) from RXD (U5, pin 1).	R100
R140	**Connects LINNSLP (MCU, pin 23) to NSLP (U5, pin 2).**	Disconnects LINNSLP (MCU, pin 23) from NSLP (U5, pin 2).	R141
R145	**Connects LIN signal line to VBAT via pull-up (LIN Master Configuration)**	Disconnects LIN signal line from VBAT (LIN Slave Configuration)	R146
R146	**Connects LIN signal line to GROUND via capacitor (LIN Master Configuration)**	Disconnects LIN signal line from GROUND (LIN Slave Configuration)	R145
R151	**Connects LIN VBAT line to Board_5V.**	Disconnects LIN VBAT line from Board_5V (External VBAT provided through J11)	

Table 6-4: LIN Option Links

6.5   I2C Configuration

Table 6-5 below details the function of the option links associated with the I2C configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R93	**Connects SCL_MTIOC0C (MCU, pin 25) to JA1_SCL (JA1, pin 26).**	Disconnects SCL_MTIOC0C (MCU, pin 25) from JA1_SCL (JA1, pin 26).	R94
R95	**Connects SDA_MTCLKB (MCU, pin 24) to JA1_SDA (JA1, pin 25).**	Disconnects SDA_MTCLKB (MCU, pin 24) from JA1_SDA (JA1, pin 25).	R96
R131	**Connects IIC bus pull-ups to Board_VCC.**	Disconnects IIC pull-ups from Board_VCC.	R132
R132	**Connects IIC bus pull-ups to Board_5V.**	Disconnects IIC bus pull-ups from Board_5V.	R131

Table 6-5: I2C Option Links

6.6   ADC Configuration

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

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R5	**Connects the MCU (VREFH0, pin58) to UC_VCC.**	Disconnects the MCU (VREFH0, pin 58) from UC_VCC.	R6
R6	Connects the MCU (VREFH0, pin 58) to CON_VREFH0.	**Disconnects the MCU (VREFH0, pin 58) from CON_VREFH0.**	R5
R7	**Connects the MCU (VREFL0, pin59) to GROUND.**	Disconnects the MCU (VREFL0, pin 59) from GROUND.	R8
R8	Connects the MCU (VREFL0, pin 59) to CON_VREFL0.	**Disconnects the MCU (VREFL0, pin 59) from CON_VREFL0.**	R7
R9	**Connects the MCU (AVCC0, pin57) to UC_VCC.**	Disconnects the MCU (AVCC0, pin 57) from UC_VCC.	R10
R10	Connects the MCU (AVCC0, pin 57) to CON_AVCC0.	**Disconnects the MCU (AVCC0, pin 57) from CON_AVCC0.**	R9
R11	**Connects the MCU (AVSS0, pin 60) to GROUND.**	Disconnects the MCU (AVSS0, pin 60) from GROUND.	R12
R12	Connects the MCU (AVSS0, pin 60) to CON_AVSS.	**Disconnects the MCU (AVSS0, pin 60) from CON_AVSS.**	R11
R13	**Connects the potentiometer (RV1) to Board_VCC.**	Disconnects the potentiometer (RV1) from Board_VCC.	R14
R14	Connects the potentiometer (RV1) to CON_AVCC0.	**Disconnects the potentiometer (RV1) from CON_AVCC0.**	R13
R15	**Connects the MCU (AN000, pin 56) to the potentiometer (RV1).**	Disconnects MCU (AN000, pin 56) from the potentiometer (RV1)	-

Table 6-6: ADC Option Links

6.7   RS232 Serial Port Configuration

Table 6-7 below details the function of the option links associated with serial port configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R50	Connects S_SHIELD to GROUND.	**Disconnects S_SHIELD from GROUND.**	-
R51	Connects T2OUT (U4, pin 8) to serial connector (pin 8).	**Disconnects T2OUT (U4, pin 8) from serial connector (pin 8).**	J10
R52	Connects R2IN (U4, pin 9) to serial connector (pin 7).	**Disconnects R2IN (U4, pin 9) from serial connector (pin 7).**	J10
R55	Connects SHDNn (U4, pin 20) to GROUND.	**Disconnects SHDNn (U4, pin 20) from GROUND.**	-
R56	Connects ENn (U4, pin 1) to Board_VCC.	**Disconnects ENn (U4, pin 1) from Board_VCC.**	-
R59	Connects RS232TX (JA6, pin 5) to T1IN (U4, pin 13).	**Disconnects RS232TX (JA6, pin 5) from T1IN (U4, pin 13).**	R61, R63
R60	Connects RS232RX (JA6, pin 6) to R1OUT (U4, pin 15).	**Disconnects RS232RX (JA6, pin 6) from R1OUT (U4, pin 15).**	R62, R64
R65	**Connects TXD12 (MCU, pin 19) to T2IN (U4, pin 12).**	Disconnects TXD12 (MCU, pin 19) from T2IN (U4, pin 12).	R98
R66	**Connects RXD12 (MCU, pin 18) to R2OUT (U4, pin 10).**	Disconnects RXD12 (MCU, pin 18) from R2OUT (U4, pin 10).	R100
R61	**Connects TXD0 (MCU, pin 45) to T1IN (U4, pin 13).**	Disconnects TXD0 (MCU, pin 45) from T1IN (U4, pin 13).	R59, R63, R78
R62	**Connects RXD0 (MCU, pin 46) to R1OUT (U4, pin 15).**	Disconnects RXD0 (MCU, pin 46) from R1OUT (U4, pin 15).	R60, R64, R76
R63	Connects TXD1 (MCU, pin 16) to T1IN (U4, pin 13).	**Disconnects TXD1 (MCU, pin 16) from T1IN (U4, pin 13).**	R59, R61, R103, R104, R105
R64	Connects RXD1 (MCU, pin 14) to R1OUT (U4, pin 15).	**Disconnects RXD1 (MCU, pin 14) from R1OUT (U4, pin 15).**	R60, R62, R109, R110, R111
R104	Connects TDO_TXD1_GTIOC2A (MCU, pin 16) to TXD1 (JA6, pin 9).	**Disconnects TDO_TXD1_GTIOC2A (MCU, pin 16) from TXD1 (JA6, pin 9).**	R103, R105, R59, R61, R63
R107	Connects TCK_FINEC_SCK1_GTIOC1B (MCU, pin 15) to SCK1 (JA6, pin 11).	**Disconnects TCK_FINEC_SCK1_GTIOC1B (MCU, pin 15) from SCK1 (JA6, pin 11).**	R106, R108
R110	Connects TDI_RXD1_GTIOC1A (MCU, pin 14) to RXD1 (JA6, pin 12).	**Disconnects TDI_RXD1_GTIOC1A (MCU, pin 14) from RXD1 (JA6, pin 12).**	R109, R111, R60, R62, R64
R98	Connects LINTXD_TXD12 (MCU, pin 19) to TXD12 (JA6, pin 8).	**Disconnects LINTXD_TXD12 (MCU, pin 19) from TXD12 (JA6, pin 8).**	R97, R65
R100	Connects LINTXD_RXD12 (MCU, pin 18) to RXD12 (JA6, pin 7).	**Disconnects LINTXD_RXD12 (MCU, pin 18) from RXD12 (JA6, pin 7).**	R99, R66
R101	**Connects SCK12_GTIOC2B (MCU, pin 17) to SCK12 (JA6, pin 10).**	Disconnects SCK12_GTIOC2B (MCU, pin 17) from SCK12 (JA6, pin 10).	R102

Table 6-7: RS232 Serial Port Option Links

6.8   IRQ & General I/O Pin Configuration

Table 6-8 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.
R16	**Connects the MCU (P70, pin 39) to POE0n**	Disconnects the MCU (P70, pin 39) from POE0n.	-
R17	**Connects the MCU (PE2, pin 11) to NMI_POE10n .**	Disconnects MCU (PE2, pin 11) from NMI_POE10n	R116, R117
R35	**Connects LED0, LED1, LED2 and LED3 to Board_VCC.**	Disconnects LED0, LED1, LED2 and LED3 from Board_VCC.	
R67	**Connects IRQ2-DS_GTIOC3A (MCU, pin 2) to IRQ2-DS.**	Disconnects IRQ2-DS_GTIOC3A (MCU, pin 2) from IRQ2-DS	R68, R124, R125, R126
R68	Connects IRQ2-DS_GTIOC3A (MCU, pin 2) to GTIOC3A (JA1, pin 22).	**Disconnects IRQ2-DS_GTIOC3A (MCU, pin 2) from GTIOC3A (JA1, pin 22).**	R67
R69	**Connects IO0_GTIOC3B (MCU, pin 4) to GTIOC3B (JA2, pin 20).**	Disconnects IO0_GTIOC3B (MCU, pin 4) from GTIOC3B (JA2, pin 20).	R70
R70	Connects IO0_GTIOC3B (MCU, pin 4) to IO0 (JA1, pin 15).	**Disconnects IO0_GTIOC3B (MCU, pin 4) from IO0 (JA1, pin 15).**	R69
R71	**Connects CTS0RTS0_MTIC5W (MCU, pin 48) to CTS0RTS0 (JA2 pin 12).**	Disconnects CTS0RTS0_MTIC5W (MCU, pin 48) to CTS0RTS0 (JA2 pin 12).	R72
R72	Connects CTS0RTS0_MTIC5W (MCU, pin 48) to MTIC5W (JA6 pin 16).	**Disconnects CTS0RTS0_MTIC5W (MCU, pin 48) from MTIC5W (JA6 pin 16).**	R71
R73	**Connects SCK0_MTIC5V (MCU, pin 47) to SCK0 (JA2, pin 10).**	Disconnects SCK0_MTIC5V (MCU, pin 47) from SCK0 (JA2, pin 10).	R74
R74	Connects SCK0_MTIC5V (MCU, pin 47) to MTIC5V (JA6, pin 15).	**Disconnects SCK0_MTIC5V (MCU, pin 47) from MTIC5V (JA6, pin 15).**	R73
R75	**Connects RXD0_MTIC5U (MCU, pin 46) to RXD0 (JA2, pin 8).**	Disconnects RXD0_MTIC5U (MCU, pin 46) from RXD0 (JA2, pin 8).	R76, R62
R76	Connects RXD0_MTIC5U (MCU, pin 46) to MTIC5U (JA6, pin 14).	**Disconnects RXD0_MTIC5U (MCU, pin 45) from MTIC5U (JA6, pin 14).**	R75
R77	**Connects TXD0_MTIOC0B (MCU, pin 45) to TXD0 (JA2, pin 6).**	Connects TXD0_MTIOC0B (MCU, pin 45) from TXD0 (JA2, pin 6).	R78, R61
R78	Connects TXD0_MTIOC0B (MCU, pin 45) to MTIOC0B.	**Disconnects TXD0_MTIOC0B (MCU, pin 45) from MTIOC0B.**	R77, R122, R123
R79	**Connects DLCDD4_IO4 (MCU, pin 32) to DLCDD4 (LCD, pin 11).**	Disconnects DLCDD4_IO4 (MCU, pin 32) from DLCDD4 (LCD, pin 11).	R80
R80	Connects DLCDD4_IO4 (MCU, pin 32) to IO4 (JA1, pin 19).	**Disconnects DLCDD4_IO4 (MCU, pin 32) from IO4 (JA1, pin 19).**	R79

Table 6-8: IRQ & General I/O Option Links (continued overleaf)

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R81	**Connects DLCDD5_IO5 (MCU, pin 31) to DLCDD5 (LCD, pin 12),**	Disconnects DLCDD5_IO5 (MCU, pin 31) from DLCDD5 (LCD, pin 12).	R82
R82	Connects DLCDD5_IO5 (MCU, pin 31) to IO5 (JA1, pin 20).	**Disconnects DLCDD5_IO5 (MCU, pin 31) from IO5 (JA1, pin 20).**	R81
R83	**Connects DLCDD6_IO6 (MCU, pin 30) to DLCDD6 (LCD, pin 13),**	Disconnects DLCDD6_IO6 (MCU, pin 30) from DLCDD6 (LCD, pin 13),.	R84
R84	Connects DLCDD6_IO6 (MCU, pin 30) to IO6 (JA1, pin 21).	**Disconnects DLCDD6_IO6 (MCU, pin 30) from IO6 (JA1, pin 21).**	R83
R85	**Connects DLCDD7_IO7 (MCU, pin 29) to DLCDD7 (LCD, pin 14),**	Disconnects DLCDD7_IO7 (MCU, pin 29) from to DLCDD7 (LCD, pin 14),	R86
R86	Connects DLCDD7_IO7 (MCU, pin 29) to IO7 (JA1, pin 22).	**Disconnects DLCDD7_IO7 (MCU, pin 29) from IO7 (JA1, pin 22).**	R85
R87	**Connects DLCDE_IO2 (MCU, pin 28) to DLCDE (LCD, pin 6),**	Disconnects DLCDE_IO2 (MCU, pin 28) from DLCDE (LCD, pin 6),	R88
R88	Connects DLCDE_IO2 (MCU, pin 28) to IO2 (JA1, pin 17).	**Disconnects DLCDE_IO2 (MCU, pin 28) from to IO2 (JA1, pin 17).**	R87
R89	**Connects DLCDRS_IO3 (MCU, pin 27) to DLCDRS (LCD, pin 4),**	Disconnects DLCDRS_IO3 (MCU, pin 27) from DLCDRS (LCD, pin 4),	R90
R90	Connects DLCDRS_IO3 (MCU, pin 27) to IO3 (JA1, pin 18).	**Disconnects DLCDRS_IO3 (MCU, pin 27) from IO3 (JA1, pin 18).**	R89
R91	**Connects IO1_MTIOC0D (MCU, pin 26) to MTIOC0D (JA2, pin 19).**	Disconnects IO1_MTIOC0D (MCU, pin 26) from MTIOC0D (JA2, pin 19).	R92
R92	Connects IO1_MTIOC0D (MCU, pin 26) IO1 (JA1, pin 16).	**Disconnects IO1_MTIOC0D from (MCU, pin 26) from IO1 (JA1, pin 16).**	R91
R94	Connects SCL_MTIOC0C (MCU, pin 25) to MTIOC0C.	**Disconnects SCL_MTIOC0C (MCU, pin 25) from MTIOC0C.**	R93, R126
R96	Connects SDA_MTCLKB (MCU, pin 24) to MTCLKB (JA2 pin 26).	**Disconnects SDA_MTCLKB (MCU, pin 24) from MTCLKB (JA2 pin 26).**	R95
R102	Connects SCK12_GTIOC2B (MCU, pin 17) to GTIOC2B (JA5 pin 24).	**Disconnects SCK12_GTIOC2B (MCU, pin 17) from GTIOC2B (JA5 pin 24).**	R101
R105	Connects TDO_TXD1_GTIOC2A (MCU, pin 16) to GTIOC2A (JA5, pin 23).	**Disconnects TDO_TXD1_GTIOC2A (MCU, pin 16) from GTIOC2A (JA5, pin 23).**	R103, R104
R108	Connects TCK_FINEC_SCK1_GTIOC1B (MCU, pin 15) to GTIOC1B (JA5, pin 22).	**Disconnects TCK_FINEC_SCK1_GTIOC1B (MCU, pin 15) from GTIOC1B (JA5, pin 22).**	R106, R107
R111	Connects TDI_RXD1_GTIOC1A (MCU, pin 14) to GTIOC1A (JA5, pin 21).	**Disconnects TDI_RXD1_GTIOC1A (MCU, pin 14) from GTIOC1A (JA5, pin 21).**	R109, R110

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

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R113	Connects TMS_GTIOC0B (MCU, pin 13) to GTIOC0B (JA5, pin 20).	**Disconnects TMS_GTIOC0B (MCU, pin 13) from GTIOC0B (JA5, pin 20).**	R112
R115	Connects TRSTn_GTIOC0A (MCU, pin 12) to GTIOC0A (JA5, pin 19).	**Disconnects TDI_RXD1_GTIOC1A (MCU, pin 14) from GTIOC0A (JA5, pin 19).**	R114
R116	**Connects NMI_POE10n (MCU, pin 11) to NMI (JA2, pin 3).**	Disconnects NMI_POE10n (MCU, pin 11) from NMI (JA2, pin 3).	R117, R17
R117	Connects NMI_POE10n (MCU, pin 11) to POE10n (JA5, pin 16).	**Disconnects NMI_POE10n (MCU, pin 11) from POE10n (JA5, pin 16).**	R116, R17
R118	**Connects MTIOC3C (MCU, pin 41) to MTIOC3C_PIN11 (JA2, pin 11).**	Disconnects MTIOC3C (MCU, pin 41) from MTIOC3C_PIN11 (JA2, pin 11).	R119
R119	Connects MTIOC3C (MCU, pin 41) to MTIOC3C_PIN21 (JA2, pin 21).	**Disconnects MTIOC3C (MCU, pin 41) from MTIOC3C_PIN21 (JA2, pin 21).**	R118
R141	Connects LINNSLP_MTCLKA (MCU, pin 23) to MTCLKA (JA2, pin 25).	**Disconnects LINNSLP_MTCLKA (MCU, pin 23) from MTCLKA (JA2, pin 25).**	R140
R120	**Connects IRQ0-DS (MCU, pin 62) to JA2_PIN7 (JA2, pin 7).**	Disconnects IRQ0-DS (MCU, pin 62) from JA2_PIN7 (JA2, pin 7).	R121, R31
R121	Connects MTIOC0A (MCU, pin 43) to JA2_PIN7 (JA2, pin 7).	**Disconnects MTIOC0A (MCU, pin 43) from JA2_PIN7 (JA2, pin 7).**	R120
R122	**Connects IRQ1-DS (MCU, pin 61) to JA2_PIN9 (JA2, pin 9).**	Disconnects IRQ1-DS (MCU, pin 61) from JA2_PIN9 (JA2, pin 9).	R123, R32
R123	Connects MTIOC0B to JA2_PIN9 (JA2, pin 9).	**Disconnects MTIOC0B from JA2_PIN9 (JA2, pin 9).**	R122, R78
R124	**Connects IRQ2-DS to JA2_PIN23 (JA2, pin 23).**	Disconnects IRQ2-DS from JA2_PIN23 (JA2, pin 23).	R125, R126, R67, R33
R125	Connects MTIOC1A (MCU, pin 63) to JA2_PIN23 (JA2, pin 23).	**Disconnects MTIOC1A (MCU, pin 63) from JA2_PIN23 (JA2, pin 23).**	R124, R126
R126	Connects MTIOC0C to JA2_PIN23 (JA2, pin 23).	**Disconnects MTIOC0C from JA2_PIN23 (JA2, pin 23).**	R124, R125, R94

Table 6-10: IRQ & General I/O Option Links

6.9   User Switch Configuration

Table 6-11 below details the function of the option links associated with user switches.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R31	**Connects the switch SW1 to IRQ0-DS (MCU, pin 62).**	Disconnects the switch SW1 from IRQ0-DS (MCU, pin 62).	R120
R32	**Connects the switch SW2 to IRQ1-DS (MCU, pin61).**	Disconnects the switch SW2 from AN004_IRQ12 (MCU, pin 90).	R122
R33	**Connects the switch SW3 to IRQ2-DS**	Disconnects the switch SW3 from IRQ2-DS	R34, R67 R124
R34	Connects the switch SW3 to ADTRG0n (MCU, pin 64).	**Disconnects the switch SW3 from ADTRG0n (MCU, pin 64).**	R33, R56, R60, R61

Table 6-11: User Switch Option Links

6.10 Power Supply Configuration

Table 6-12 below details the function of the option links associated with power supply configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R19	**Connects PWR connector (pin 3) to the input pin of U2 (IN) and VSEL2 (J7, pin 3).**	Disconnects PWR connector (pin 3) from the input pin of U2 (IN) and VSEL2 (J7, pin 3).	-
R20	**Connects CON_5V (JA1, pin 1) to PWR connector (pin 3).**	Disconnects CON_5V (JA1, pin 1) from PWR connector (pin 3).	R21
R21	Connects Unregulated_VCC (JA6, pin 23) to PWR connector (pin 3).	**Disconnects Unregulated_VCC (JA6, pin 23) from PWR connector (pin 3).**	R20
R22	Connects VSEL1 (J6, pin 2) to Vin (U3, pin 5).	**Disconnects VSEL1 (J6, pin 2) from Vin (U3, pin 5).**	-
R23	**Connects CON_3V3 (JA1, pin 3) to VSEL1 (J6, pin 2).**	Disconnects CON_3V3 (JA1, pin 3) from VSEL1 (J6, pin 2).	-
R24	**Connects J5 pins 1 and 2, bypassing current measurement jumper J5.**	Disconnects J5 pins 1 and 2.	J5
R27	Connects VSEL2 (J7) pins 1 and 2. Board_5V is supplied from U3.	**Disconnects VSEL2 (J7) pins 1 and 2. Board_5V is not supplied from U3.**	J7

Table 6-12: Power Supply Option Links

Table 6-13 below details the function of the jumpers associated with power supply configuration.

Reference	Position One	Position Two	Position Three	Related Ref.
J5*	Pins 1 and 2 shorted. Connects Board_VCC to UC_VCC.	Disconnects UC_VCC from Board_VCC. Connect an ammeter across pins for power measurement.	n/a	R24
J6	**Pins 1 and 2 shorted. Connects Board_VCC to the input pin (Vin) of voltage regulator U3.**	Pins 2 and 3 shorted. Voltage regulator U2 supplies the 3.3V Board_VCC.	All pins open. DO NOT SET.	R22
J7	**Pins 1 and 2 shorted. Connects the 5V output of U3 to Board_5V.**	Pins 2 and 3 shorted. Board_5V is supplied directly from PWR connector.	All pins open. DO NOT SET.	R27

Table 6-13 Power Supply Jumpers

* J5 header is not fitted by default.

6.11   Clock Configuration

Table 6-14 below details the function of the option links associated with clock configuration.

Reference	Link Fitted Configuration	Link Removed Configuration	Related Ref.
R4	Connects EXTAL (MCU, pin 9) to CON_EXTAL (JA2, pin 2 and J1, pin 9).	**Disconnects EXTAL (MCU, pin 9) from CON_EXTAL (JA2, pin 2 and J1, pin 9).**	R2
R3	Connects XTAL (MCU, pin 7) to CON_XTAL (J1, pin 7).	**Disconnects XTAL (MCU, pin7) from CON_XTAL (J1, pin 7).**	R1
R1	**Connects XTAL (MCU, pin 7) to X1 (pin 1).**	Disconnects XTAL (MCU, pin 7) from X1 (pin 1).	R3
R2	**Connects EXTAL (MCU, pin 9) to X1 (pin 2).**	Disconnects EXTAL (MCU, pin 9) from X1 (pin 2).	R4

Table 6-14: Clock Option Links

RENESAS

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	57*	6	AVSS	-
7	AVREF	58*	8	ADTRG	64
9	AD0	56	10	AD1	55
11	AD2	54	12	AD3	53
13	DA0	nc	14	DA1	nc
15	IO_0	4*	16	IO_1	26*
17	IO_2	28*	18	IO_3	27*
19	IO_4	32*	20	IO_5	31*
21	IO_6	30*	22	IO_7	29*
23	IRQ3/IRQAEC/M2_HSIN0	21	24	IIC_EX	nc
25	IIC_SDA	24*	26	IIC_SCL	25*

Table 7-1: Application Header JA1 Connections

* Connection made through option link

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	6	2	EXTAL	9*
3	NMI	11	4	Vss1	-
5	WDT_OVF	nc	6	SCIaTX	45*
7	IRQ0/M1_HSIN0	43/62*	8	SCIaRX	46*
9	IRQ1/M1_HSIN1	45/61*	10	SCIaCK	47*
11	M1_UD	41*	12	CTSRTS	48*
13	M1_UP	38	14	M1_UN	35
15	M1_VP	37	16	M1_VN	34
17	M1_WP	36	18	M1_WN	33
19	TimerOut	26*	20	TimerOut	4*
21	TimerIn	41*	22	TimerIn	2*
23	IRQ2/M1_EncZ/M1_HSIN2	2*/25*/63*	24	M1_POE	39
25	M1_TRCCLK	23*	26	M1_TRDCLK	24*

Table 7-2: Application Header JA2 Connections

* Connection made through option link

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	52	2	AD5	51
3	AD6	50	4	AD7	49
5	CAN1TX	nc	6	CAN1RX	nc
7	CAN2TX	nc	8	CAN2RX	nc
9	IRQ4/M2_EncZ/M2_HSIN1	nc	10	IRQ5/M2_HSIN2	nc
11	M2_UD	nc	12	M2_Uin	nc
13	M2_Vin	nc	14	M2_Win	nc
15	M2_Toggle	nc	16	M2_POE	11*
17	M2_TRCCLK	nc	18	M2_TRDCLK	nc
19	M2_UP	12*	20	M2_UN	13*
21	M2_VP	14*	22	M2_VN	15*
23	M2_WP	16*	24	M2_WN	17*

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	-	6	RS232RX	-
7	SCIbRX	18*	8	SCIbTX	19*
9	SCIcTX	16*	10	SCIbCK	17*
11	SCIcCK	15*	12	SCIcRX	14*
13	M1_Toggle	40	14	M1_Uin	46*
15	M1_Vin	47*	16	M1_Win	48*
17	Reserved	nc	18	Reserved	nc
19	Reserved	nc	20	Reserved	nc
21	Reserved	nc	22	Reserved	nc
23	Unregulated_VCC	-	24	GROUND Vss	-

Table 7-4: Application Header JA6 Connections

7.2   Microcontroller Pin Headers

This RSK is fitted with MCU pin headers, which are used to access all the MCU's pins.

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	EMLE	1	2	IRQ2-DS_GTIOC3A	2
3	NC	nc	4	IO0_GTIOC3B	4
5	MD_FINED	5	6	RESn	6
7	CON_XTAL	7	8	GROUND	-
9	CON_EXTAL	9	10	UC_VCC	-
11	NMI_POE10n	11	12	TRSTn_GTIOC0A	12
13	TMS_GTIOC0B	13	14	TDI_RXD1_GTIOC1A	14
15	TCK_FINEC_SCK1_GTIOC1B	15	16	TDO_TXD1_GTIOC2A	16
17	NC	nc	18	NC	nc
19	NC	nc	20	NC	nc
21	NC	nc	22	NC	nc
23	NC	nc	24	NC	nc
25	NC	nc	26	NC	nc
27	NC	nc	28	NC	nc
29	NC	nc	30	NC	nc
31	NC	nc	32	NC	nc
33	NC	nc	34	NC	nc
35	NC	nc	36	NC	nc

Table 7-5: Microcontroller Pin Header J1 Connections

* Connection made through option link**.**

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 Net Name	MCU Pin
1	SCK12_GTIOC2B	17	2	LINRXD_RXD12	18
3	LINTXD_TXD12	19	4	UC_VCC	-
5	IRQ3-DS	21	6	GROUND	-
7	LINNSLP_MTCLKA	23	8	SDA_MTCLKB	24
9	SCL_MTIOC0C	25	10	IO1_MTIOC0D	26
11	DLCDRS_IO3	27	12	DLCDE_IO2	28
13	DLCDD7_IO7	29	14	DLCDD6_IO6	30
15	DLCDD5_IO5	31	16	DLCDD4_IO4	32
17	NC	nc	18	NC	nc
19	NC	nc	20	NC	nc
21	NC	nc	22	NC	nc
23	NC	nc	24	NC	nc
25	NC	nc	26	NC	nc
27	NC	nc	28	NC	nc
29	NC	nc	30	NC	nc
31	NC	nc	32	NC	nc
33	NC	nc	34	NC	nc
35	NC	nc	36	NC	nc

Table 7-6: Microcontroller Pin Header J2 Connections

* Connection made through option link**.**

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	33	2	MTIOC4C	34
3	MTIOC3D	35	4	MTIOC4B	36
5	MTIOC4A	37	6	MTIOC3B	38
7	POE0n	39	8	MTIOC3A	40
9	MTIOC3C	41	10	UC_VCC	-
11	MTIOC0A	43	12	GROUND	-
13	TXD0_MTIOC0B	45	14	RXD0_MTIC5U	46
15	SCK0_MTIC5V	47	16	CTS0RTS0_MTIC5W	48
17	NC	nc	18	NC	nc
19	NC	nc	20	NC	nc
21	NC	nc	22	NC	nc
23	NC	nc	24	NC	nc
25	NC	nc	26	NC	nc
27	NC	nc	28	NC	nc
29	NC	nc	30	NC	nc
31	NC	nc	32	NC	nc
33	NC	nc	34	NC	nc
35	NC	nc	36	NC	nc

Table 7-7: Microcontroller Pin Header J3 Connections

* Connection made through option link**.**

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	AN007	49	2	AN006	50
3	AN005	51	4	AN004	52
5	AN003	53	6	AN002	54
7	AN001	55	8	AN000	56
9	CON_AVCC0	57*	10	CON_VREFH0	58*
11	CON_VREFL0	59*	12	CON_AVSS0	60*
13	IRQ1-DS	61	14	IRQ0-DS	62
15	MTIOC1A	63	16	ADTRG0n	64
17	NC	nc	18	NC	nc
19	NC	nc	20	NC	nc
21	NC	nc	22	NC	nc
23	NC	nc	24	NC	nc
25	NC	nc	26	NC	nc
27	NC	nc	28	NC	nc
29	NC	nc	30	NC	nc
31	NC	nc	32	NC	nc
33	NC	nc	34	NC	nc
35	NC	nc	36	NC	nc

Table 7-8: Microcontroller Pin Header J4 Connections

* Connection made through option link.

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 E1/E20 Emulator Additional Document for User's Manual (R20UT0399EJ).

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 and 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 RX63T 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 (R20UT0398EJ).

8.5   Address Space

Figure 8-1 below details the address space of MCU. For further details, refer to the RX63T group hardware manual.
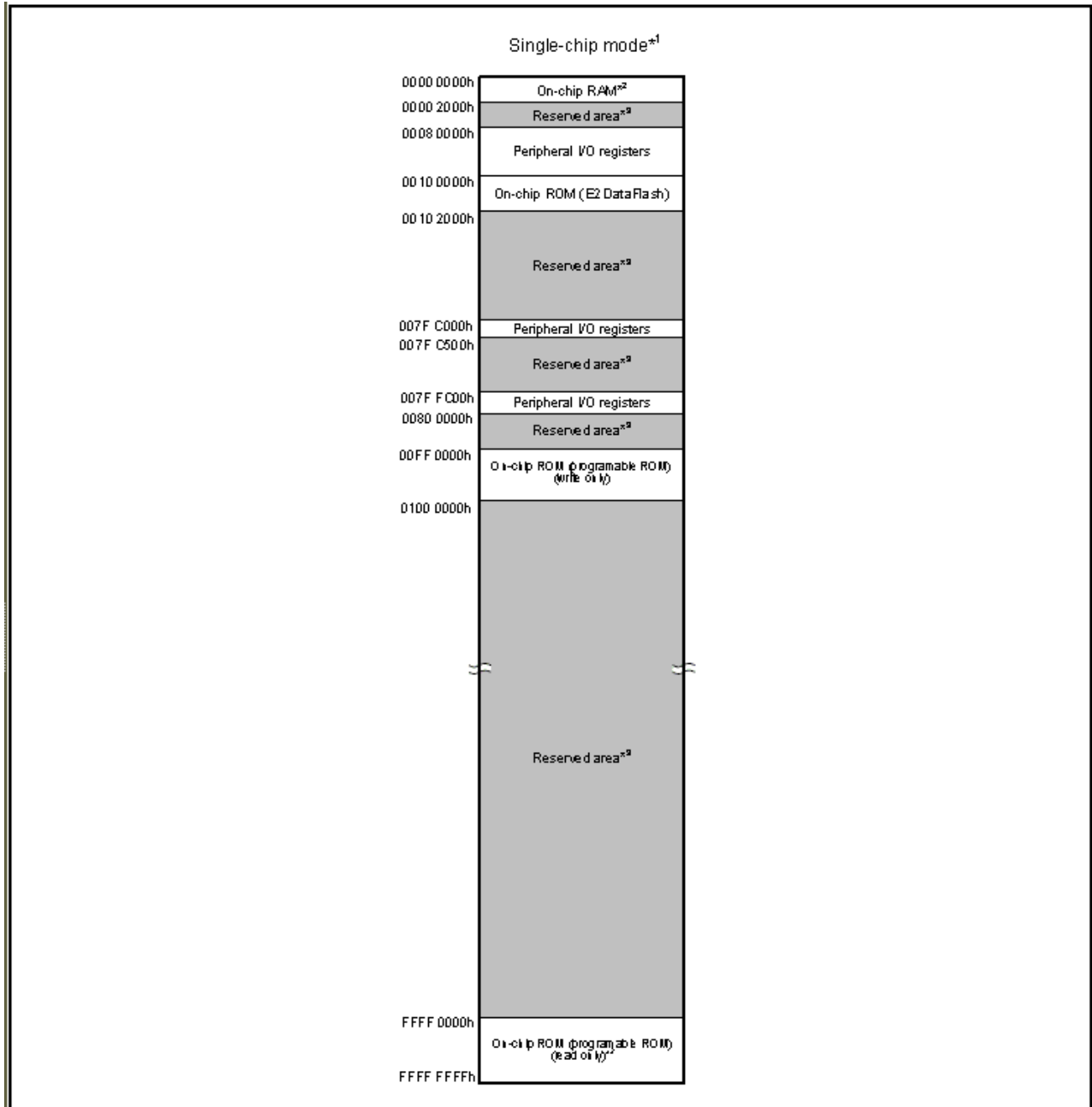

Figure 8-1: MCU Address Space Diagram

9. Additional Information

Technical Support
For details on how to use e2studio, refer to the help file by opening e2studio, then selecting Help > Help Contents from the menu bar.

For information about the RX63T series microcontrollers refer to the RX63T Group hardware manual.

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

Technical Contact Details

Please refer to the contact details listed in section 8 of the **"Quick Start Guide".**

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

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