



RL78/G24 GUIDE FOR ENGINEER

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EMBEDDED PROCESSING 2ND BUSINESS DIVISION
EMBEDDED PROCESSING PRODUCT GROUP
RENESAS ELECTRONICS CORPORATION

The information/materials required at the time of product development summarized and listed for each development phase. Application notes are a list of regrouped by contents.
Please use it as a guidebook when developing.

CONTENT

We summarized and listed up various information and materials required at the time of product development by each development phase.

Also, You can select what you need for your application from our rich selection of application notes that describing how to use a peripheral punction, example applications, how to create a program, and more.

Please use these information, materials and application notes as a guidebook when developing.

List of information and materials required for product development

- [Step1: MCU selection](#)
- [Step2: Designing and evaluating](#)
- [Step3: Mass production](#)

[List of application notes](#)

STEP1 MCU SELECTION

	Item	Content	Link
1	Hardware information	Datasheet	Doc
2	Products & Solutions	RL78 Family Features	Web site
3		Video	Web site
4		Blog	Web site
5		Reference designs (Winning combination)	Web site
6	Product longevity program (PLP)	Overview of product longevity program (PLP)	Web site
7		Product selection (product selector) Note: Refer to PLP column in the chart.	Web site
8	Product Specification Comparison	Introductory Guide to RL78 Microcontrollers	Web site
9		RL78 FAMILY Selection Guide	Doc

STEP2 DESIGNING AND EVALUATING (1/3)

	Item	Content	Link
Common			
1	Hardware	User's manual: Hardware	Doc
2		Hardware manual guide (Electrical Characteristic edition)	Doc
3		Technical update (errata information)	Web site
4		Product change notice (PCN)	Web site
5		Part number guide for RL78 family product (the meaning of character in part number)	Doc
6		Semiconductor reliability handbook	Doc
7		RELIABILITY REPORT	Doc
8		RoHS Product Options → Part Number → Package information → RoHS Info	Web site
9	Software information	RL78 Family User's Manual: Software	Doc
10		RL78 Software Porting Guide Porting sample code generated by Smart Configurator (CS+, e2 studio, IAR)	Doc
11	Evaluation board (for general purpose)	RL78/G24 Fast Prototyping Board (RL78/G24 FPB)	Web site
12	Solution Board	RL78/G24 DC/DC LED Control Evaluation Board	Web site
13		RL78/G24 Motor Control Evaluation Kit	Web site
14	Partner information	Partner products (system solutions provider)	Web site
15		RL78 Partner Ecosystem	Web site

STEP2 DESIGNING AND EVALUATING (2/3)

	Item	Content	Link
Hardware design			
1	Board simulates	ECAD model Note: ECAD can be found by clicking on the respective part number of the product options.	Web site
2	Other	Resonator and matching circuit information	Doc
3		Package information (package outline information, mount manual, etc.)	Web site
4	Development environment	E1/E20/E2 Emulator, E2 Emulator Lite Additional Document for User's Manual (Notes on Connection of RL78)	Doc
Software design			
1	Software information	Getting Started with the RL78 Family Development Environment	Web site
2		RL78 Family Development Environment — Development Tools	Web site
3		RL78 Family Development Environment — Software	Web site
4		RL78 Smart Configurator User's Guide: e ² studio	Doc
5		RL78 Smart Configurator User's Guide: CS+	Doc
6		RL78 Smart Configurator User's Guide: IAREW	Doc
7	Training information	RL78 Family Software & Tool Course (Video Collection)	Web site
8	System design	RL78 Low Power MCU	Doc

STEP2 DESIGNING AND EVALUATING (3/3)

	Item	Content	Link
Solution			
1	RL78 Motor Control Solutions	Motor Control Solutions	Web site
2	DALI Solutions	DALI communication Solutions	Web site
3	IoT Solutions	IoT Solutions	Doc
Support			
1	Support information	FAQ (frequently asked inquiries)	Web site
2		RL78 forum (community)	Web site
3		Ask to technical support Note: Please click login in the upper right corner	Web site

STEP3 MASS PRODUCTION

	Item		Content	Link
1	Writing a program	Programmer	PG-FP6	Web site
2		Writing tool	Renesas flash programmer (GUI tool for PC)	Web site
3	Firmware update	Application note	RL78/G22,RL78/G23,RL78/G24 Firmware Update Module	Doc Sample

RL78/G24 APPLICATION NOTE

SUPPLEMENTARY INFORMATION: PLEASE REFER TO THE APPLICATION NOTE LIST AS NECESSARY.

#	Main items	Overview
1	Basic	Hardware Design/Clock/Voltage/Memory
2	Peripheral	MCU peripheral function
3	Safety	Safety function
4	Self programming	Flash writing
5	Security / Crypto	Security/Crypto
6	Connectivity	Wireless of WiFi/LTE , Wired of Modbus ASCII/RTU, PMBUS, DMX512
7	DALI	DALI solution
8	Flash program	Flash programming
9	Memory Driver	Memory driver
10	File System	FAT file system
11	Sound	ADPCM
12	Firmware update	Firmware update
13	Sensor	Sensor
14	Motor	Motor
15	Reality AI	Reality AI
16	Software relation	Software
17	Others	Other

RL78/G24 APPLICATION NOTE [BASIC]

Item	Title	Summary	Sample code
1	RL78 Family Board Support Package Module Using Software Integration System	The Renesas board support package SIS module (r_bsp) forms the foundation of any project that uses Software Integration System (SIS) modules.	Download
2	RL78 Family RL78 Hardware CRC Functions	Many applications need to check the integrity of a code image or data communication stream by using a CRC function to verify data errors have not occurred.	Download
3	RL78 Family RL78 Low Power MCU	The purpose of this application note is to show prospective users the advantages of the new Renesas RL78 low power 16bit MCU family over the major 8/16/32 low power MCU competitors, and how to utilize key RL78 low power features	-
4	Current Consumption Tuning Solution (E2 Emulator, e2 studio)	This application note introduces the current consumption tuning solution using the E2 emulator.	-
5	Current Consumption Tuning Solution(E2 Emulator, CS+)	This application note introduces the current consumption tuning solution using the E2 emulator.	-
6	RL78/G23 Voltage Detector	This application note describes how to use the two voltage detectors (LVD) mounted on the RL78/G23 to detect two voltage values.	Download
7	RL78/G23 Voltage Detection Circuits	This application note explains how to use the two voltage detection circuits (LVDs) incorporated into the RL78/G23 microcontroller.	Download
8	RL78/G23 Using VBAT Pin	This application note describes how to use the VBAT pin (battery backup power) of RL78/G23.	Download
9	RL78 Minimizing Power Consumption when Sensing Switch Inputs	This document describes methods to minimize power dissipation when monitoring switch inputs.	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [PERIPHERAL(1/2)]

Item	Title	Summary	Sample code
1	RL78/G23 Realtime Clock	This application note shows usage examples of the fixed-cycle interrupt function and the alarm interrupt function of the realtime clock (RTC).	Download
2	RL78/G23 How to Use the Output Current Control Ports	This application note describes how to use the output current control ports.	Download
3	RL78/G23 Timer Array Unit (Interval timer)	This application note describes the interval timer function of the timer array unit (TAU).	Download
4	RL78/G23 Timer Array Unit (PWM output)	This application note describes how to use the PWM output function of the timer array unit (TAU).	Download
5	RL78/G23 Timer Array Unit (Pulse Interval Measurement: Period)	This application note describes how the timer array unit (TAU) measures the interval of the pulse.	Download
6	RL78/G23 Timer Array Unit (Pulse Interval Measurement: Width)	This application note describes how the timer array unit (TAU) measures the interval of the pulse.	Download
7	RL78/G23 32-Bit Interval Timer (8-bit counter mode)	This application note describes how to use the 32-bit interval timer channels in 8-bit counter mode.	Download
8	RL78/G24 Timer RD2 Using Input Capture Function and Output Compare Function	This application note explains how to utilize both the input capture function and output compare function of the timer RD2 in timer mode on the RL78/G24.	Download
9	RL78/G24 Timer RD2 in Timer Mode (PWM Function)	This document describes a method to output a PWM waveform using the timer mode's PWM function (hereinafter referred to as PWM function) in the RL78/G24 timer RD2.	Download
10	RL78/G24 Timer RG2 Buffer Operation in PWM Mode	This application note explains a method to output a PWM waveform using buffer operation in PWM mode of RL78/G24 Timer RG2.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [PERIPHERAL(2/2)]

Item	Title	Summary	Sample code
11	RL78/G24 Timer RG2 in Phase Counting Mode	This application note explains how to utilize the phase counting mode of the RL78/G24's Timer RG2 to detect the phase difference between external input signals coming from the TRGCLKA and TRGCLKB pins.	Download
12	RL78/G14, RL78/G1C, RL78/L12, RL78/L13, RL78/L1C, RL78/G23 Group Clock Synchronous Single Master Control Software Using CSI Mode of Serial Array Unit	This application note explains clock synchronous control of a single master by using the 3-wire serial I/O communications (CSI mode) of the serial array unit (SAU) of the RL78/G14, RL78/G1C, RL78/L12, RL78/L13, RL78/L1C, RL78/G23 Group and describes how to use the sample code for this application.	Download
13	RL78/G23 Handshake-based SPI Slave Transmission/Reception	This application note describes how the serial array unit (SAU) performs slave transmission/reception by the simple SPI (CSI).	Download
14	RL78/G23 Handshake-based SPI Master Transmission/Reception	This application note describes how the serial array unit (SAU) performs master transmission/reception by the simple SPI (CSI).	Download
15	RL78/G23 Serial Array Unit (UART Communication)	This application note explains how to use UART communication through the serial array unit (SAU). ASCII characters transmitted from the device on the opposite side are analyzed to make responses.	Download
16	RL78/G23 I2C Supporting Multiple Slave Address (Master)	This application note describes how to use the master function of the I2C bus by using the IICA serial interface. In the procedure described, you will operate four serial memory areas (256 bytes x 4) specified by different slave addresses.	Download
17	RL78/G23 I2C Supporting Multiple Slave Addresses (Slave)	This application note describes how to use the slave function of the I2C bus that supports multiple slave addresses by using the all addresses matching function of the RL78/G23.	Download
18	RL78/G24 TIMER WINDOW Output using Timer RD2, Timer Array Unit and Comparato	This application note explains the TIMER WINDOW output function based on the combined use of the RL78/G24 timer RD2, timer array unit (TAU), and comparator (CMP).	Download
19	RL78/G24 Flexible Application Accelerator (FAA) Tool Guide: CS+	This guide describes the options that must be set for the build process and debugger of the flexible application accelerator (FAA) contained in RL78/G24. It also describes how to operate the debugger.	Download
20	RL78/G24 Flexible Application Accelerator (FAA) Tool Guide: e2 studio	This guide describes the options that must be set for the build process and debugger of the flexible application accelerator (FAA) contained in RL78/G24. It also describes how to operate the debugger.	Download
21	RL78/G24 FAA LED Control Library Installation Guide	This application note describes the LED control library using the Flexible Application Accelerator (FAA) .	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SAFETY]

Item	Title	Summary	Sample code
1	RL78/G23 Safety Function (A/D Test)	This application note explains the sample code for the A/D test function, which is one of the safety functions of the RL78/G23.	Download
2	RL78/G23 Safety Function (Frequency Detection)	This application note describes the frequency detection function which is one of the safety features offered by the RL78/G23.	Download
3	RL78/G23 Safety Function (Flash Memory CRC Operation Function)	This application note explains how to use the flash memory CRC operation function, which is one of the safety functions incorporated in the RL78/G23.	Download
4	RL78/G23 Method of Setting Flash Read Protection	This application note describes the flash read protection function of the RL78/G23.	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SELF PROGRAMMING]

Item	Title	Summary	Sample code
1	RL78 Family Renesas Flash Driver RL78 Type 01 SC version (Flash Common)	This document explains Renesas Flash Driver RL78 Type 01 for the RL78/G2x group in the case of using Smart Configurator(SC).	Download
2	Renesas Flash Driver RL78 Type 01 User's Manual for RL78/G2x	Renesas Flash Driver RL78 Type 01 (hereafter called RFD RL78 Type 01) is software for reprogramming the flash memory in the RL78/G2x.	-
3	RL78 Family Renesas Flash Driver RL78 Type 01 SC version (Code Flash)	This document explains Renesas Flash Driver RL78 Type 01 for the RL78/G2x group in the case of using Smart Configurator(SC).	Download
4	RL78 Family Renesas Flash Driver RL78 Type 01 SC version (Extra Area)	This document explains Renesas Flash Driver RL78 Type 01 for the RL78/G2x group in the case of using Smart Configurator(SC).	Download
5	RL78/G23 Self-Programming Using Boot Swapping via UART communications	This manual is intended to give users an understanding of the methods for using the Renesas Flash Driver (RFD) RL78 Type 01 to reprogram the flash memory in the RL78/G2x microcontroller.	Download
6	RL78 Family Renesas Flash Driver RL78 Type 01 SC version (Data Flash)	This document explains Renesas Flash Driver RL78 Type 01 for the RL78/G2x group in the case of using Smart Configurator(SC).	Download
7	Data FLASH Converter (Data FLASH memory image generation)	The Data FLASH Converter is a windows based tool that generates a Data FLASH memory image from EEPROM emulation data and/or from a program code file that is mapped to the Data FLASH area of a Renesas microcontroller.	-
8	EEPROM Emulation Software RL78 Type 01 User's Manual for RL78/G2x	EEPROM emulation is a feature used to store data in the on-board flash memory in the same way as EEPROM. In EEPROM emulation, EEPROM Emulation Software RL78 Type 01 operates the Renesas Flash Driver (RFD) RL78 Type 01. And RFD writes and reads the data flash memory	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SECURITY / CRYPTO]

Item	Title	Summary	Sample code
1	RL78 Family AES Library: Introduction Guide	This document explains AES Library for the RL78 Family (hereafter referred to as "AES Library") that depends on MCUs.	Download
2	RL78/G24 FAA AES Library Introduction Guide	This document presents information on introduction of the RL78/G24 FAA AES library (abbreviated below as "AES library").	Download
3	RL78 Family RSA Library: Introduction Guide	This document explains RSA Library for RL78 Family (hereafter referred to as "RSA Library") that depends on MCUs.	Download
4	RL78 Family SHA Hash Function Library: Introduction Guide	This document explains SHA Hash Function Library for the RL78 Family (hereafter referred to as "SHA Libraly") that depends on MCUs	Download
5	RL78 Family True Random Number Generator (TRNG) Software Driver	This document describes the specifications and usage of the software driver that generates random numbers using the true random number generator (TRNG) on an RL78 Family MCU.	Download
6	RL78 Family How to change devices in the sample project for the DSP Library and the Security Library	This document describes the procedures for migrating the driver and middleware sample code projects shown in the table below to other RL78 family devices	-
7	RL78/G23 Unique ID Read Driver	Each RL78/G2x chip is programmed with a unique ID. The unique ID can be used to prevent unauthorized use of software IP and is useful for managing products individually.	Download
8	RL78/G23 Third-Party Program Protection	This application note describes the third-party program protection functionality of the RL78/G23.	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [CONNECTIVITY]

Item	Title	Summary	Sample code
1	RL78/G22 Wi-Fi Communication (Soft AP mode) with DA16200/DA16600	This application note describes the usage of the US159-DA16XXXMEVZ Wi-Fi control module, which conforms to the Software Integration System (SIS) standard.	Download
2	RL78/G22 LTE MQTT Communication	This application note explains how to perform LTE communication using RL78/G22 and RYZ024A. RYZ024A is a cellular module capable of LTE Cat M1/NB1/NB2 communication.	Download
3	RL78/G22 Modbus ASCII/RTU	This Application Note describes a sample program that combines an RL78 microcontroller with a Renesas RS-485 transceiver to enable master/slave functionality over Modbus ASCII/RTU.	Download
4	RL78 Family PMBus Slave Module Software Integration System	This application note describes the PMBus Slave module.	Download
5	RL78 Family PMBus Master Module Software Integration System	This application note describes the PMBus Master module.	Download
6	RL78 Family PMBus communication sample software using SIS	This application note describes a sample application for PMBus communication using the PMBus Master module SIS (Software Integration System) and the PMBus Slave module SIS (Software Integration System).	Download
7	RL78 Family DMX512 Receive Module Software Integration System	This application note describes the DMX512 Receive module.	Download
8	RL78 Family DMX512 Receive Communication sample software using SIS	This application note describes a sample application for DMX512 communication using the DMX512 Receive module SIS (Software Integration System).	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [DALI]

Item	Title	Summary	Sample code
1	RL78/G24 DALI-2 Control Gear Basic (102) LED (207) Colour Control (209) Sample Application	This application note describes a sample application for DALI (Digital Addressable Lighting Interface) communication using RL78/G24 microcontroller.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [FLASH PROGRAM]

Item	Title	Summary	Sample code
1	RL78 Microcontroller (RL78 Protocol C) Serial Programming Guide	This application note describes the specifications of the boot firmware in RL78 microcontrollers. If the firmware is used in a way that does not conform with the descriptions in this document, correct operation is not guaranteed.	-
2	RL78 Flash Programmer (RL78 Protocol A)	This application note describes how to write the program to the internal flash memory of the RL78 microcontroller that supports the RL78 Protocol A.	Download
3	RL78 Flash Programmer (RL78 Protocol B)	This application note describes how to write the program to the internal flash memory of the RL78 microcontroller that supports the RL78 Protocol B.	Download
4	RL78 Flash Programmer (RL78 Protocol C)	This application note describes how to write the program to the internal flash memory of the RL78 microcontroller that supports the RL78 Protocol C.	Download
5	Flash programmer with Raspberry Pi (RL78 Protocol C)	This application note describes a sample program for a flash programmer that writes to the flash memory of a microcontroller that supports Protocol C.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [MEMORY DRIVER]

Item	Title	Summary	Sample code
1	RL78 Family Serial NOR Flash Memory Control Module Software Integration System	This application note describes the serial NOR flash memory control module conforming to the Software Integration System (SIS).	Download
2	RX Family, RL78 Family, 78K0R/Kx3-L Macronix International MX25/66L Family Serial NOR Flash Memory Control Software	This application note describes how to control MX25/66L serial NOR flash memory, manufactured by Macronix International Co., Ltd., using an MCU manufactured by Renesas Electronics, and it explains the usage of the sample code provided for that purpose.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [FILE SYSTEM]

Item	Title	Summary	Sample code
1	RL78 Family Open Source FAT File System M3S-TFAT-Tiny: Introduction Guide	This document explains the usage of the Open Source FAT File System M3S-TFAT-Tiny for RL78 Family (hereafter referred to as "TFAT library") along with a sample program.	Download
2	RL78 Family SPI mode MultiMediaCard Driver: Introduction Guide	This application note describes the integration method for enabling use of the M3S-TFAT-Tiny open-source FAT file system (referred to below as the TFAT library) and SPI mode multimedia card driver (referred to below as the MMC driver) in combination.	Download
3	RL78 Family Example of Integration of SPI Mode Multimedia Card Driver into M3S-TFAT-Tiny Open-Source FAT File System	This application note describes the integration method for enabling use of the M3S-TFAT-Tiny open-source FAT file system (referred to below as the TFAT library) and SPI mode multimedia card driver (referred to below as the MMC driver) in combination.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SOUND]

Item	Title	Summary	Sample code
1	RL78 Family Sound Playback/Compression System (Original ADPCM Codec) M3S-S2-Tiny: Introduction Guide	This document explains M3S-S2-Tiny for the RL78 Family (hereafter referred to as "S2 library").	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [FIRMWARE UPDATE]

Item	Title	Summary	Sample code
1	RL78/G22, RL78/G23, RL78/G24 Firmware Update Module	This application note describes the firmware update module for the RL78/G22 and RL78/G23,RL78/G24. The module is referred to below as the firmware update module.	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SENSOR]

Item	Title	Summary	Sample code
1	RL78 Family Sensor I2C Communication Middleware Control Module Software Integration System	This application note explains sensor I2C communication middleware control module for Renesas sensors using Software Integration System (SIS).	Download
2	RL78 Family Sensor Control Modules Software Integration System	This application note explains the sensor control modules for HS300x and HS400x (Renesas high performance relative humidity and temperature sensor), FS2012, FS3000 and FS1015 (Renesas High Performance Flow Sensor Module), ZMOD4410 and ZMOD4510 (Digital Gas Sensors), OB1203 (Heart Rate, Blood Oxygen Concentration, Pulse Oximetry, Proximity, Light and Color Sensor) and I2C communication middleware for Renesas sensors using Software Integration System (SIS).	-
3	RL78 Family HS300x Sensor Control Module Software Integration System	This application note explains the sensor control module for Renesas sensor HS300x (Renesas high performance relative humidity and temperature sensor) using Software Integration System (SIS).	Download
4	RL78 Family HS400X Sensor Control Module Software Integration System	This application note explains the sensor control module for Renesas sensor HS400x (Renesas high performance relative humidity and temperature sensor) using Software Integration System (SIS).	Download
5	RL78 Family FS2012 Sensor Control Module Software Integration System	This application note explains the sensor control modules for FS2012 (Renesas High Performance Flow Sensor Module) using Software Integration System (SIS).	Download
6	RL78 Family FS3000 Sensor Control Module Software Integration System	This application note explains the sensor control module for FS3000 (Renesas air velocity sensor) sensor using Software Integration System (SIS).	Download
7	RL78 Family FS1015 Sensor Control Module Software Integration System	This application note explains the sensor control module for FS1015 (Renesas air velocity sensor) sensor using Software Integration System (SIS).	Download
8	RL78 Family OB1203 Sensor Control Module Software Integration System	This application note explains the sensor control module for OB1203 (Heart Rate, Blood Oxygen Concentration, Pulse Oximetry, Proximity, Light and Color Sensor) using Software Integration System (SIS).	Download
9	RL78 Family ZMOD4410, ZMOD4450 and ZMOD4510 Sensor Control Module Software Integration System	This application note explains the sensor control modules for ZMOD4410, ZMOD4450 and ZMOD4510 (Digital Gas Sensors) using Software Integration System (SIS)	Download
10	Sensor Software Combination Manual	This application note describes code changes required to use the multiple sensor software combinations and runs on certain MCUs of the RA family, RX family, RL78 family and RZ family	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [MOTOR]

Item	Title	Summary	Sample code
1	RL78/G24 Sensorless vector control for permanent magnetic synchronous motor	This application note explains the sample programs for driving a permanent magnet synchronous motor in the sensorless vector method using the RL78/G24 microcontroller. This note also explains how to use the motor control development support tool Renesas Motor Workbench (RMW).	Download
2	RL78/G24 Sensorless vector control for permanent magnetic synchronous motor FAA Library	This application note explains the sample programs for driving a permanent magnet synchronous motor in the sensorless vector method using the Flexible Application Accelerator (FAA) contained in the RL78/G24 microcontroller. This note also explains how to use the motor control development support tool Renesas Motor Workbench (RMW).	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [REALITY AI]

Item	Title	Summary	Sample code
1	RL78 Family Reality AI Control Modules Software Integration System	This application note explains Data Shipper and Data Collector control modules for Renesas Reality AI, and general UART communication module using Software Integration System (SIS)	Download
2	RL78 Family Reality AI Data Acquisition Module (Data Collector / Data Shipper) - Sample Code	This application note describes sample software for data acquisition for Reality AI. Acquired data is converted into any files using Reality AI Data Storage Tool on PC.	Download
3	RL78 Family Reality AI UART Communication Module Software Integration System	This application note explains a UART communication module for Renesas Reality AI using Software Integration System (SIS).	Download
4	RL78 Family Reality AI Data Collector Control Module Software Integration System	This application note explains Reality AI Data Collector control modules for Renesas Reality AI using Software Integration System (SIS).	Download
5	RL78 Family Reality AI Data Shipper Control Module Software Integration System	This application note explains Reality AI Data Shipper control modules for Renesas Reality AI using Software Integration System (SIS).	Download

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [SOFTWARE RELATION]

Item	Title	Summary	Sample code
1	RL78 Software Porting Guide Porting sample code generated by Smart Configurator (CS+, e2 studio, IAR)	This application note describes how to port a software generated by RL78 Smart Configurator to another RL78. As an example, this application note explains the procedure to port the RL78/G23 sample code to the RL78/G15 sample code.	-
2	RL78 Software Porting Guide RL78/G13 sample code porting (CC-RL) (CS+, e2 studio)	This application note describes how to port the RL78/G13 peripheral sample code to another RL78.	-
3	RL78 Software Migration Guide Source Code Migration from Assembly Language to C Language CC-RL	This application note describes how to migrate the program in the assembly language for the CS+, which is the integrated development environment (IDE), to the inline assembler functions in the C language.	-
4	RL78 Software Migration Guide Migrating from CA78K0R to CC-RL (CS+)	This application note describes how to replace the source codes created by the CA78K0R C compiler for the integrated development environment CS+ with the source codes supported by the CC-RL C compiler for the integrated development environment CS+.	-
5	RL78 Debugging Functions Using the Serial Port	This application note describes how to use the RL78 debugging functions using the serial port.	-
6	RL78 Family C compiler CC-RL Programming Techniques	This application note describes how to reduce the code size, increase the execution speed, and programming techniques to avoid bugs when using the C compiler CC-RL.	-
7	RL78 Family C Compiler Package (CC-RL) Application Guide: Programming Techniques	This application note describes methods of programming for efficiency in terms of code size, speed of execution, and ROM size.	-
8	IAR Embedded Workbench for RL78 Programming Techniques	This application note describes how to reduce the code size, increase the execution speed, and programming techniques to avoid bugs when using IAR Embedded Workbench for RL78.	-
9	Integrated Development Environment e² studio How to use IAR Systems compiler in e² studio	This document describes the procedure for using the IAR Systems compiler on the e2 studio.	-

[Return to the list of main items in the application note](#)

RL78/G24 APPLICATION NOTE [OTHERS]

Item	Title	Summary	Sample code
1	RL78 Family Notes and Countermeasures Against Noise	This document describes notes and countermeasures against noise for the RL78 Family.	-
2	RL78/G24 LED control with RL78/G24	This application note describes how to control an LED lighting system using the features of the RL78/G24 microcontroller.	-
3	RL78/G24 LED Lighting Control Application Model	This application note describes how to use the simulation model for LED lighting control system using the RL78/G24 microcontroller.	Download
4	RL78 Family FFT Library: Deployment Guide	This document provides information for deploying FFT Library. Fast Fourier transform (FFT) is an algorithm that executes the discrete Fourier transform at high speed.	Download
5	RL78 Family RL78 Digital Signal Controller Library - Filter	This document presents the specifications for a Digital Signal Controller(DSC) Library function library for the Renesas RL78 which includes generic specifications, detailed specifications for filter algorithm kernels and guidelines for the DSC Library API.	Download
6	Application execution from RAM	A lot of applications require the code execution from RAM like for example due to safety reasons or e.g. in case of bootloader for flash self-programming. This document will help you to set-up the projects based on the IAR environment.	-

[Return to the list of main items in the application note](#)

[Renesas.com](https://www.renesas.com)