Software to maximize RL78 Family performance

RL78 Family Software

https://www.renesas.com/rl78-software

Rich lineup supporting development

For the RL78 Family, we provide various middleware and drivers for RL78 Family applications, including audio data, file systems, and drivers for memory.

The concept of common interface design provides flexible compatibility with many RL78 Family models. Bundled sample programs will efficiently reduce the time required before productization.

RL78 Family middleware lineup

Sound / Voice

ADPCM Encoder / Decoder

DSP / FFT

Digital filters (FIR and IIR)
FFT Library

Security / Cipher

AES Library
SHA Hash Function Library
RSA Library

File System

Open source FAT file system (TFAT)

On-chip Flash memory

Self Programming Libraries

Sensor

Sensor Software

USB

USB Driver

Serial Memory

SPI mode MultiMediaCard Driver
SPI mode MMC/SD MemoryCard Driver
SPI Serial Flash Driver
SPI Single master Single-Master Driver
SPI Serial EEPROM Driver
I²C Serial EEPROM Driver
I²C Single-Master Driver

Protocol Stack

Sub-GHz/Wi-SUN Protocol Stack
Bluetooth® Low Energy Protocol Stack
Software development environment(DALI Protocol Stack)

A variety of highly professional middleware is available

Software stack authorized by Wi-SUN* Alliance
*Wi-SUN is an international wireless communication standard

For RL78 Family Sub-GHz Wireless Communication Solutions

Communication technology using the 920-MHz band is far-reaching, highly penetrative, and resistant to interference, making it ideal for a 'smart society' connecting all kinds of indoor/outdoor objects and increase energy efficiency.

Renesas has prepared solutions, based on IEEE802.15.4g compliant high-performance LSI devices, an easy-to-use starter kit, and a software stack authorized by Wi-SUN Alliance, that allow customers to start development easily.

Sub-GHz RF Driver

The functions provided by the driver include: control of the radio frequency of RL78/G1H for transmission/reception using the frame format prescribed by IEEE802.15.4g/e; carrier sensing to prevent transmiassion collision; and control of transmission based on the ARIB STD-T108 standard for 920 MHz wireless equipment.

Stack compatible with various Wi-SUN profiles

Wi-SUN profiles (B route, FAN, HAN, and extended HAN) are international standards for various indoor and outdoor LPWAs (Low Power Wide Areas). The targets of these profiles include smart meters, HEMS (Home Energy Management Services), building management, and agricultural land management. Renesas provides a stack for controlling the RL78/G1H by using these profiles.

Evaluation Board

Evaluation Board* is certified for technological conformance in Japan and CE certification in EU member countries. It has also been adopted as a Certified Test Bed Unit (CTBU) authorized by Wi-SUN Alliance.

* Evaluation Board was developed by, and is produced and sold by Tessera Technology Inc.
For details about Evaluation Board, contact Tessera Technology Inc.

Detail www.renesas.com/solutions/proposal/subghz   Brochure www.renesas.com/solutions/proposal/subghz-catalog

Easily achieving USB data communication

USB Driver

Three device classes are provided for both USB Host and Peripheral. From these classes, you can select the necessary one according to the product in free samples for RL78 Family microcontrollers with on-board USB ports.
Common user API design easily achieves code porting between Renesas microcontrollers.

User Application
API

Host MSC	Host CDC	Host HID	Peripheral MSC	Peripheral CDC	Peripheral HID

Selectable according to the product

USB Basic F/W （for Host/Peripheral）

RL78 Family
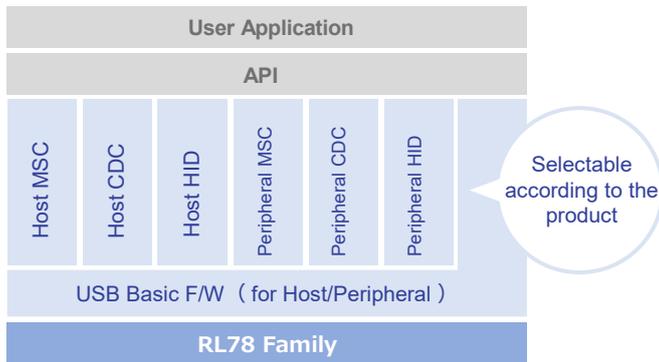
Detail www.renesas.com/driver/usb

Various self-programming software

Software for flash reprogramming

Renesas provides free flash-reprogramming library software that allows user programs to rewrite programs and data.

· Flash Self Programming Library Type01 for the RL78 Family
· Data Flash Library Type04 for RL78 Family
· Renesas Flash Driver RL78 Type 01 for RL78/G23
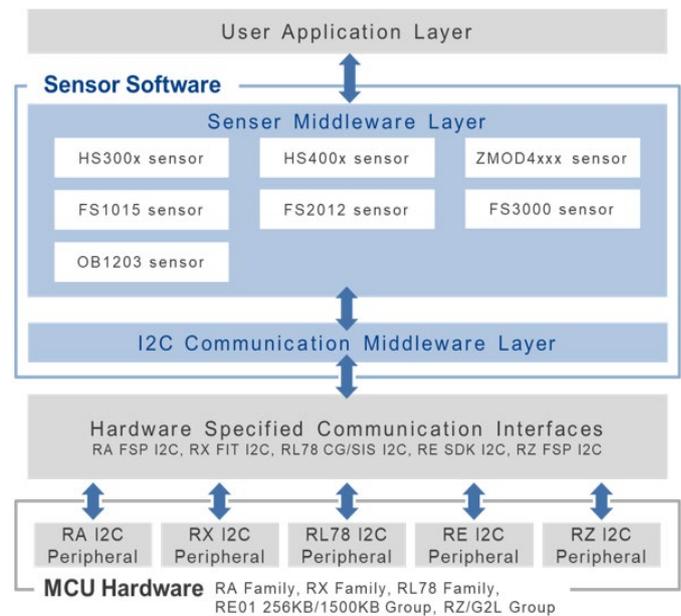· Renesas Flash Driver RL78 Type 02 for RL78/F2x

Application examples

Healthcare apparatus, rice cooker, microwave, remote controller, refrigerator, measuring instrument, etc.

Code Flash Libraries

Detail www.renesas.com/flash_libraries/self_prg

Data Flash Libraries

Detail www.renesas.com/flash_libraries/data_flash

No complicated operation required!
Easy and fast development of products using sensors

Sensor software

Renesas sensor software uses I²C communication middleware to control the I²C communication interface, thus negating the need to confirm hardware and I²C driver specifications when developing software.
Furthermore, you do not need to create calculation programs because the sensor middleware performs calculation for measured values by using sensor-specific calculation methods.
The sensor software supports both whether a realtime OS or no OS is used. You do not need to obtain case-specific libraries. So, you can develop products using sensors easily and in a short period.

Sensor software products

• Relative Humidity Sensors
• Flow Sensors
• OB1203 - Heart Rate, Blood Oxygen Concentration, Pulse Oximetry, Proximity, Light and Color Sensor
• Digital Gas Sensor Platform   *www.renesas.com/digital-gas-sensors

Application examples

Quick-Connect IoT   Indoor Air Quality Sensor (IAQ Sensor)
Refrigerator Odor Detector   Outdoor Air Quality Sensor (OAQ)
Diagnostic Equipment   Environmental Sensor Solutions

User Application Layer

Sensor Software

Senser Middleware Layer

HS300x sensor	HS400x sensor	ZMOD4xxx sensor
FS1015 sensor	FS2012 sensor	FS3000 sensor
OB1203 sensor		

I2C Communication Middleware Layer

Hardware Specified Communication Interfaces
RA FSP I2C, RX FIT I2C, RL78 CG/SIS I2C, RE SDK I2C, RZ FSP I2C

RA I2C Peripheral	RX I2C Peripheral	RL78 I2C Peripheral	RE I2C Peripheral	RZ I2C Peripheral

MCU Hardware RA Family, RX Family, RL78 Family, RE01 256KB/1500KB Group, RZ/G2L Group

Detail www.renesas.com/sensor-software

▶ Video

We provide various tutorial and tip videos related to development environments for the RL78 Family, including getting-started videos for beginners.

www.renesas.com/rl78-how-to-video

? FAQ   en-support.renesas.com/knowledgeBase

✓ Community community.renesas.com

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