True Low Power™ Platform for 8-/16-bit Applications

RL78 Microcontrollers

Renesas Electronics Singapore
sg.renesas.com

RL78 – True Low Power Microcontroller Platform

RL78 microcontrollers (MCUs) from Renesas Electronics are an advanced family of general-purpose and application-specific MCUs, combining true low power and high performance operation. The RL78 is designed specifically for ultra-low-power applications. The innovative Snooze mode allows serial communication and ADC operation in standby, which makes it best-in-class for battery powered designs.

Why RL78

- World's best-in-class performance for an equivalent MCU family
- Scalability of physical size including smart pin layout
- System cost saving features
- Wide voltage operation
- Wide temperature operation
- On-chip security features

An extensive ecosystem and more details on the RL78 can be found at **sg.renesas.com/RL78**

True Low Power

- 66µA/MHz operation
- 0.57µA (RTC & LVD)
- Unique "Snooze" mode

Extensive Ecosystem

- Advanced development tools
- Third-party support
- Online resources
- Online training: Renesas Interactive

Broad Scalability

- 10 to 128 pins
- 1KB to 512KB Flash
- Pin compatibility
- Peripheral I/O redirection capability

High Quality & Safety

- Flash memory with ECC
- Safety support included IEC 60730
- High temperature support: -40°C to 105°C

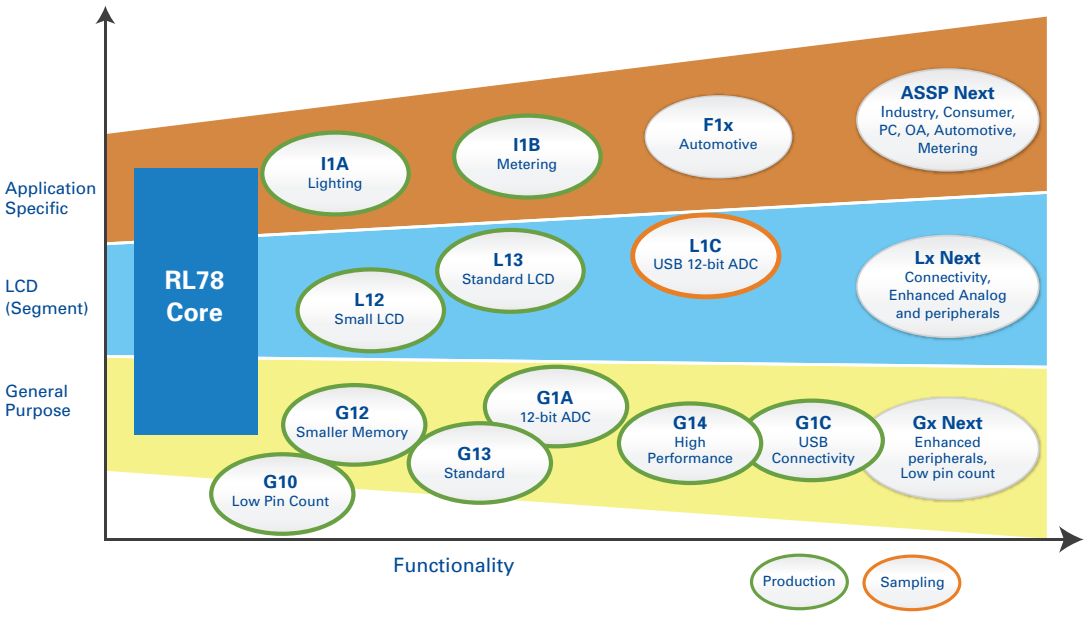
System Cost Reduction

- 32/64MHz (+/- 1%) OCO
- On-chip low voltage detection circuit
- Data flash with BGO

High Efficiency

- Up to 1.39 DMIPS/MHz
- 1.6V to 5.5V operation
- DMA/DTC/ELC

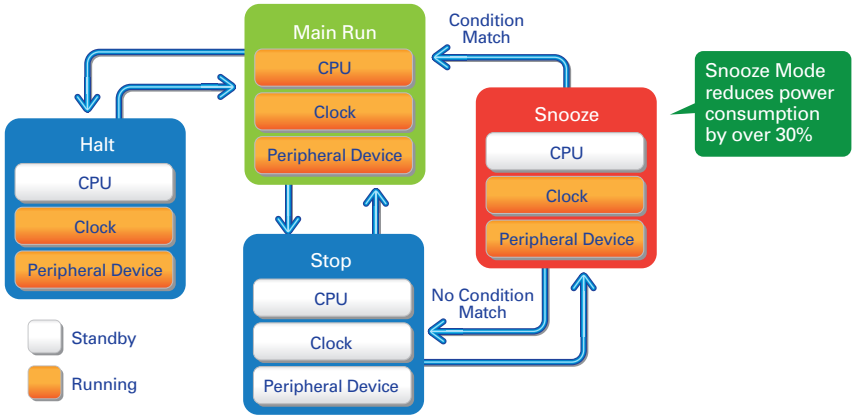
RL78 Roadmap



RL78 Low Power Modes

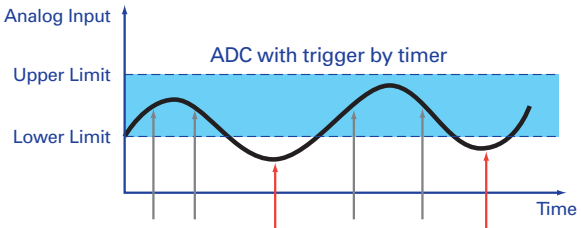
RL78 offers multiple power saving modes

- RL78's three low power modes maximize battery life by disabling idle CPU features



Snooze Mode

- No need to wake up CPU for receiving data
- The unique Snooze Mode allows some peripherals; i.e., ADC and UART operation, while in standby modes
- Achieve 1/10 of the power consumption; snooze mode uses 0.5mA vs. 5mA in run mode (ADC)



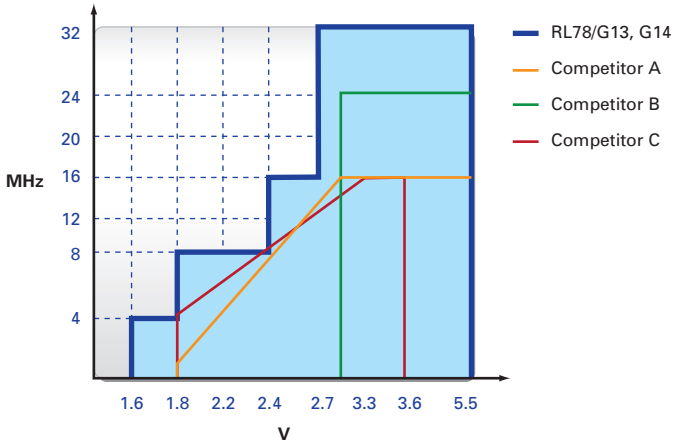
Snooze Mode ADC conversion example

ADC values out of range: Wakes up the CPU and processes the results

Standby Modes

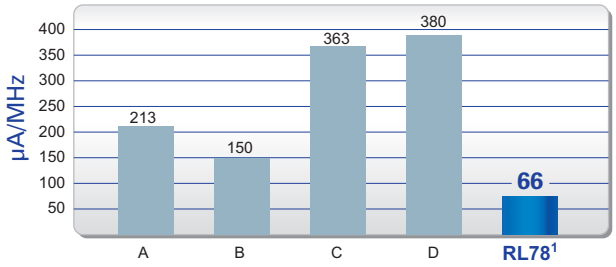
- Halt mode disables CPU operation, saving as much as 80% of total MCU current, while allowing fast CPU enable time
- Stop mode achieves lowest power consumption by disabling CPU functions

RL78 Wide Operating Voltage

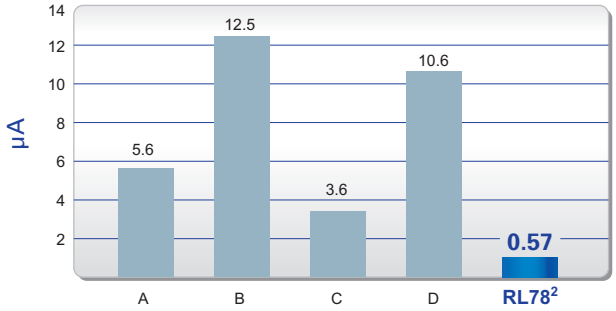


Power Consumption Values

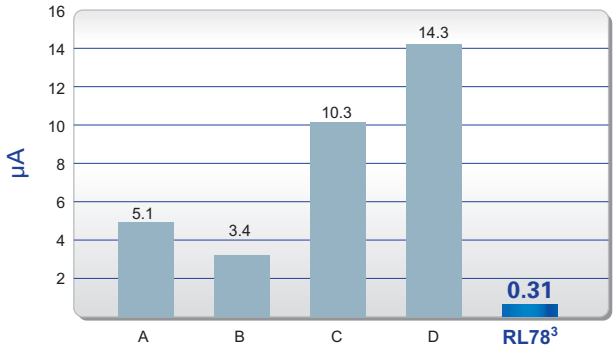
Run Mode



Halt Mode: RTC + LVD



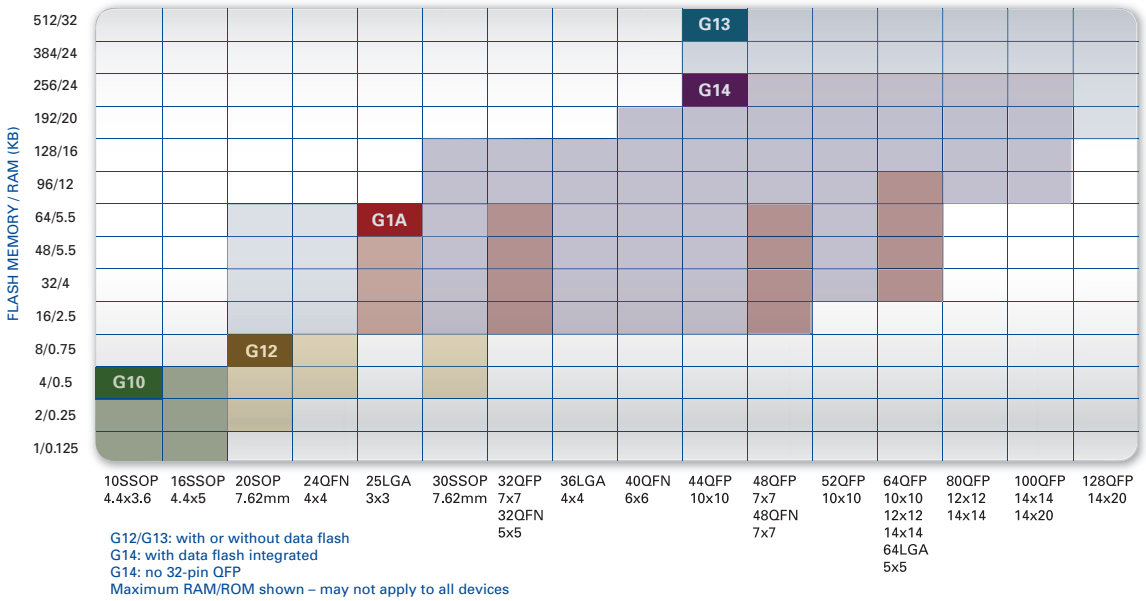
Stop Mode: LVD



Note:
1: At 32MHz (NOP instructions)
2: 0.49µA (RTC only)
3: 0.23µA (all stopped, RAM retained) & LVD only 0.08µA

RL78 General Purpose (G Series) Lineup

Packages available down to 3x3mm

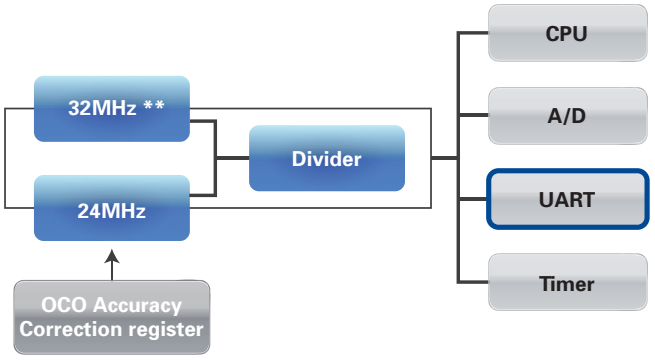


G12/G13: with or without data flash
G14: with data flash integrated
G14: no 32-pin QFP
Maximum RAM/ROM shown – may not apply to all devices

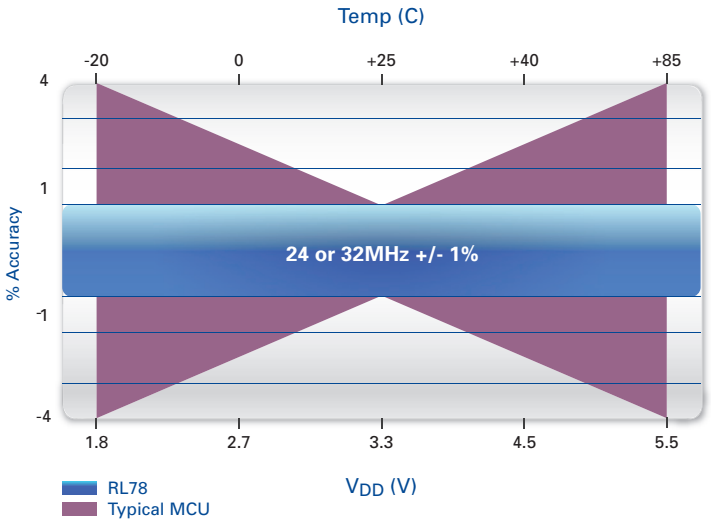
RL78 Reduces System Cost

High-accuracy On-chip Oscillator

- **+/-1% accuracy over temperature and voltage (-20 to 85ºC) *****
- **+/- 1.5% accuracy over temperature and voltage (-40 to 85ºC) *****
- Two pre-set frequencies:
  24MHz and 32MHz *
  16MHz, 12MHz, 8MHz, 4MHz, 3MHz, 2MHz,
  1MHz using divider
- Improved accuracy with correction register



* RL78/G13
** On-chip Oscillator
*** RL78/G10 2% (-20 to 85ºC), 3% (-40 to 85ºC)



RL78 Applications

RL78 offers system designers key advantages for next-generation designs, reducing system power, enhancing integration and providing a cost-effective platform approach.

Industrial Automation

- The RL78 offers an extensive range of small packages
- RL78 has standard and extended temperature range devices from -40°C to +85°C

Consumer

- Integrated USB 2.0 LS/FS module, host and peripheral capability
- RL78 MCUs offer a full calendar function
- RL78 has an integrated temperature sensor

White Goods

- RL78 offers integrated safety compliance for white goods (IEC 60730)
- RL78 offers high temperature support
- RL78's integrated peripherals make it the ideal choice for cost-sensitive white goods

Lighting

- RL78/I1A offers dedicated DALI and Power Factor control
- RL78's free windows based Applilet software makes it easy for designers to turn around a lighting design with little design experience
- RL78/IA integrates high resolution PWM timers

Home Automation

- For long battery life, RL78 offers class-leading low power, including the unique Snooze mode
- Integrated LCD driver with up to 8 commons and 35 segments
- Battery operation down to 1.6V

Power Tools

- Renesas is renowned for high-quality long-life MCUs
- RL78 is available in multiple packages and scalable for the platform design approach

Medical

- When a small package MCU with long product life is required, RL78 is your first choice
- Renesas has provided solutions for Tier-one medical manufacturers and is part of the Continua Alliance

Metering

- RL78's low power modes make the MCU ideal to meet industry power consumption requirements
- RL78 is analog rich, ideal for smart metering applications
- Renesas has 30 years of experience providing high quality and long product life MCUs for metering applications

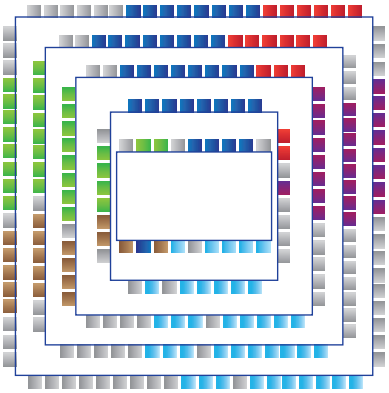
Motor Control

- RL78/G14 family features integrated motor control timers
- RL78's on-chip oscillators with 1% accuracy provide an integrated low-cost solution for timing critical applications

Compatibility

RL78 MCUs offer full pin compatibility

- I/O and peripheral pins scale up
- Easily add additional I/O and functionality by migrating to a larger pin count
- Keep peripheral pin PCB layout in the same order/position as pin count is increased
- Software code can be reused across the full RL78 family from 10 pins to 128 pins



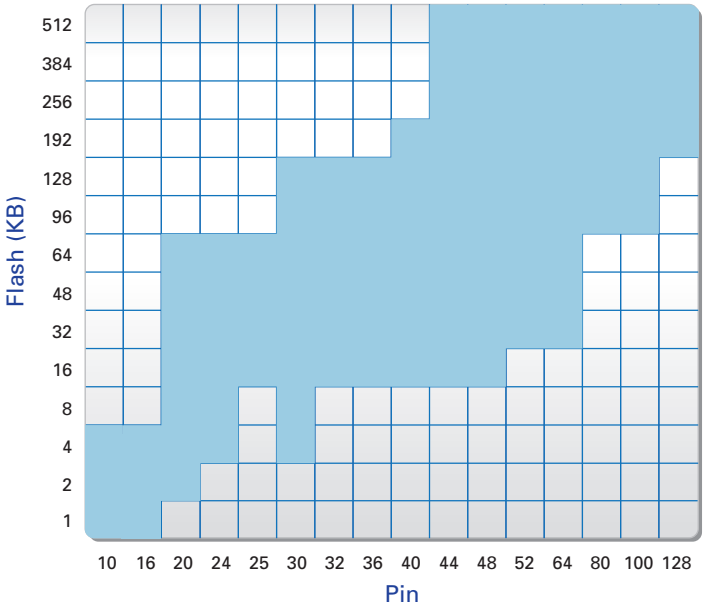
P0 P2
P1 P5
P7
System Pins

The color-coded pins of the RL78/Gxx Series, as shown in the example, show actual I/O port commonality from a 20-pin SSOP up through 80-pin QFP package version.

Scalability

RL78 offers an unprecedented lineup

- Over 300 devices
- Available in 10- to 128-pin packages & 1KB to 512KB Flash

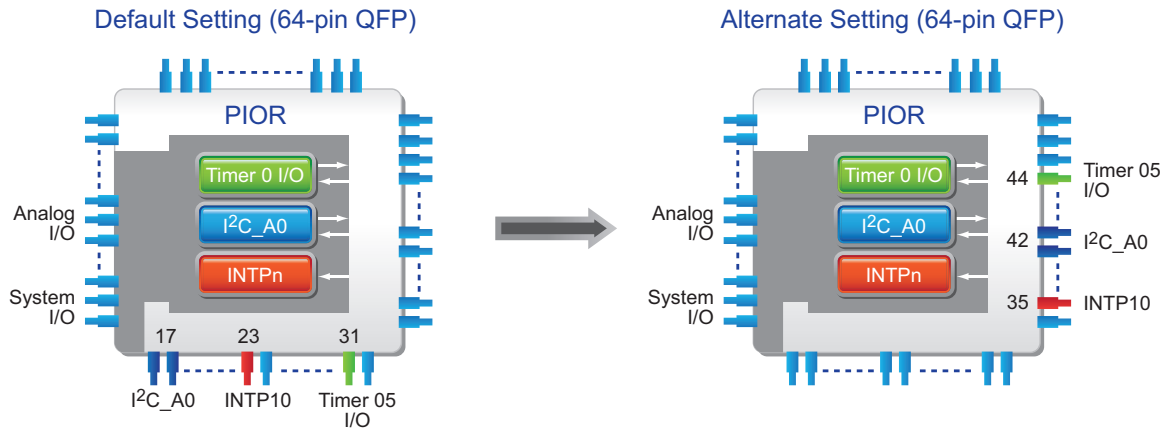


Flexibility

Peripheral I/O Redirection (PIOR) capability remaps functions to alternate ports

- Due to layout or peripheral pin sharing constraint, there may be conflicts for existing peripheral I/O pin assignments
- Optimize peripheral pin functionality by easing function bottlenecks on a pin

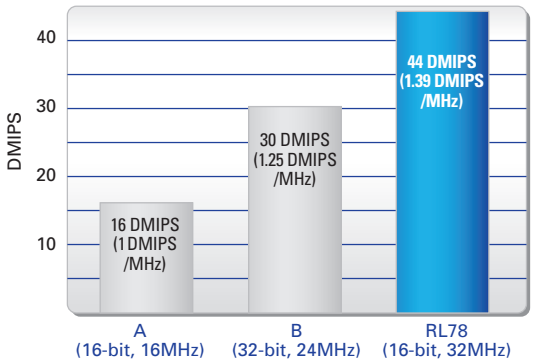
PIOR capability can help ease a bottleneck, as shown in this example, by remapping to alternate pins



High Efficiency

RL78/G14 offers up to 44 DMIPS performance at 32MHz

- Unrivaled power consumption/performance ratio (1/3 that of competitors)
- Higher DMIPS rating and lower power consumption than a popular 32-bit competitor technology
- RL78 offers widest operating voltage in its class from1.6V to 5.5V
- 85% instructions executed in one or two clock cycles

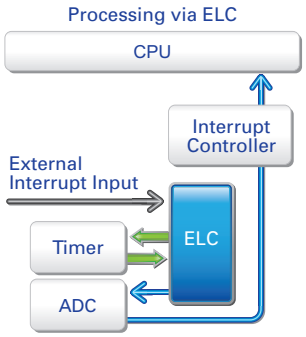


Advanced Features

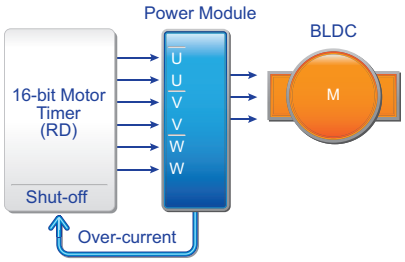
Event Link Controller (ELC)

- ELC reduces interrupt processing
- ELC improves real time function and reduces program size by using less interrupts

Improved overall performance as ELC independently controls the operation reducing CPU overhead



Specialized Motor Timers



- Integrated motor control timer functions
- Timer RD supports 4 modes of operation: Timer Mode, Reset Synchronous PWM Mode, Complementary PWM Mode and PWM3 Mode
- Security shut-off function for over current or high impedance detection

Safety Features

Hardware for IEC/UL 60730 compliance

CRC

Two types of CRC hardware

- Flash Memory
- Serial Interface

RAM

Parity / Write Protection

- Parity: Internal reset when parity error generated on Read or Write
- Write Protection: Select from: ~128B/~256B/~512B

SFR

Write Protection

- Write protection for: Port setting, interrupt setting, clock setting, LVI setting
- RAM parity setting

CPU

Illegal memory access detection

- Illegal memory access: generates “internal reset”
- Trap instruction “FF” instruction generates “internal reset”

Clock

Stop Detection / Frequency check

- Stop detection: possible to detect by WWDT
- Frequency check: possible to check by timer function

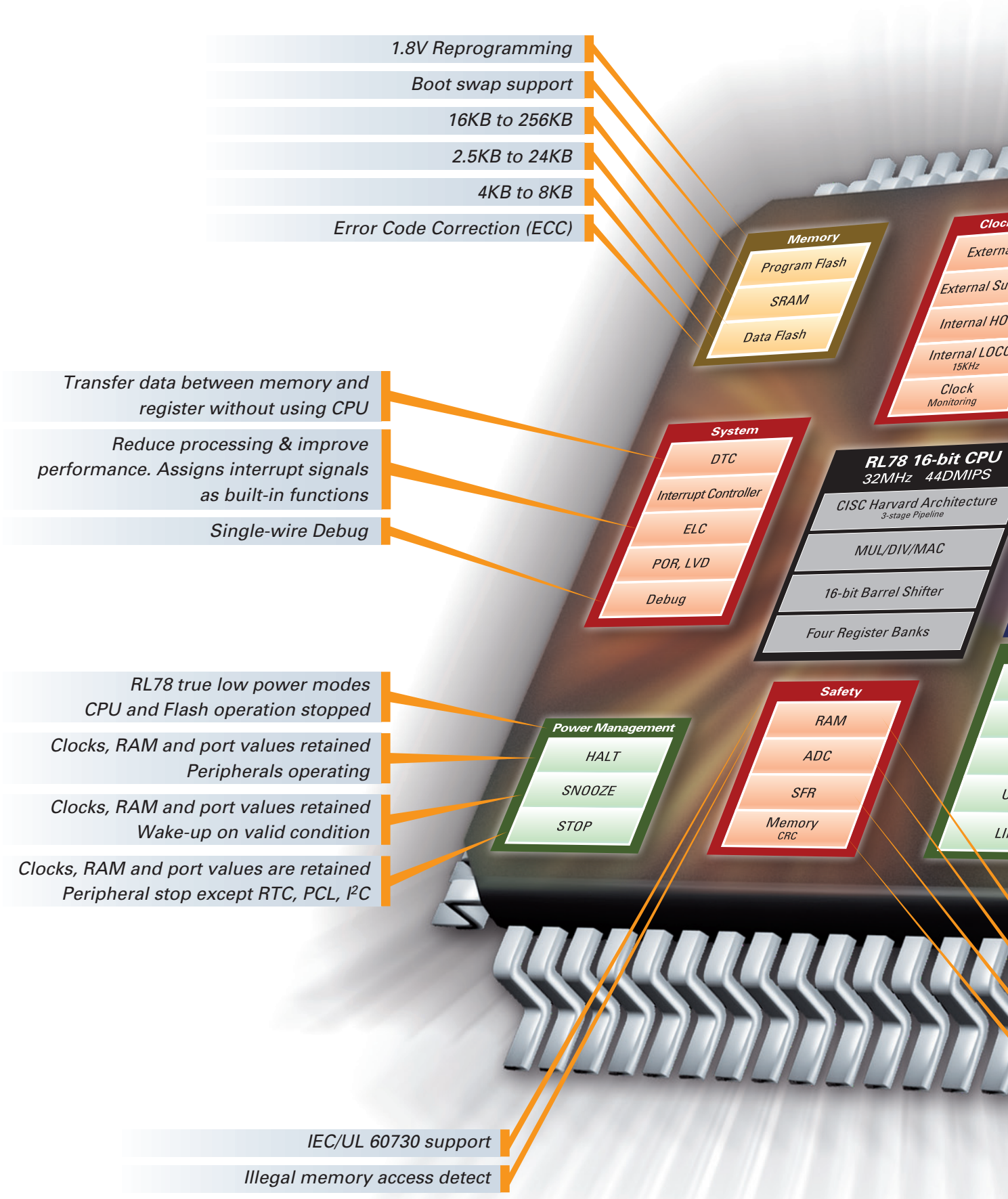
ADC

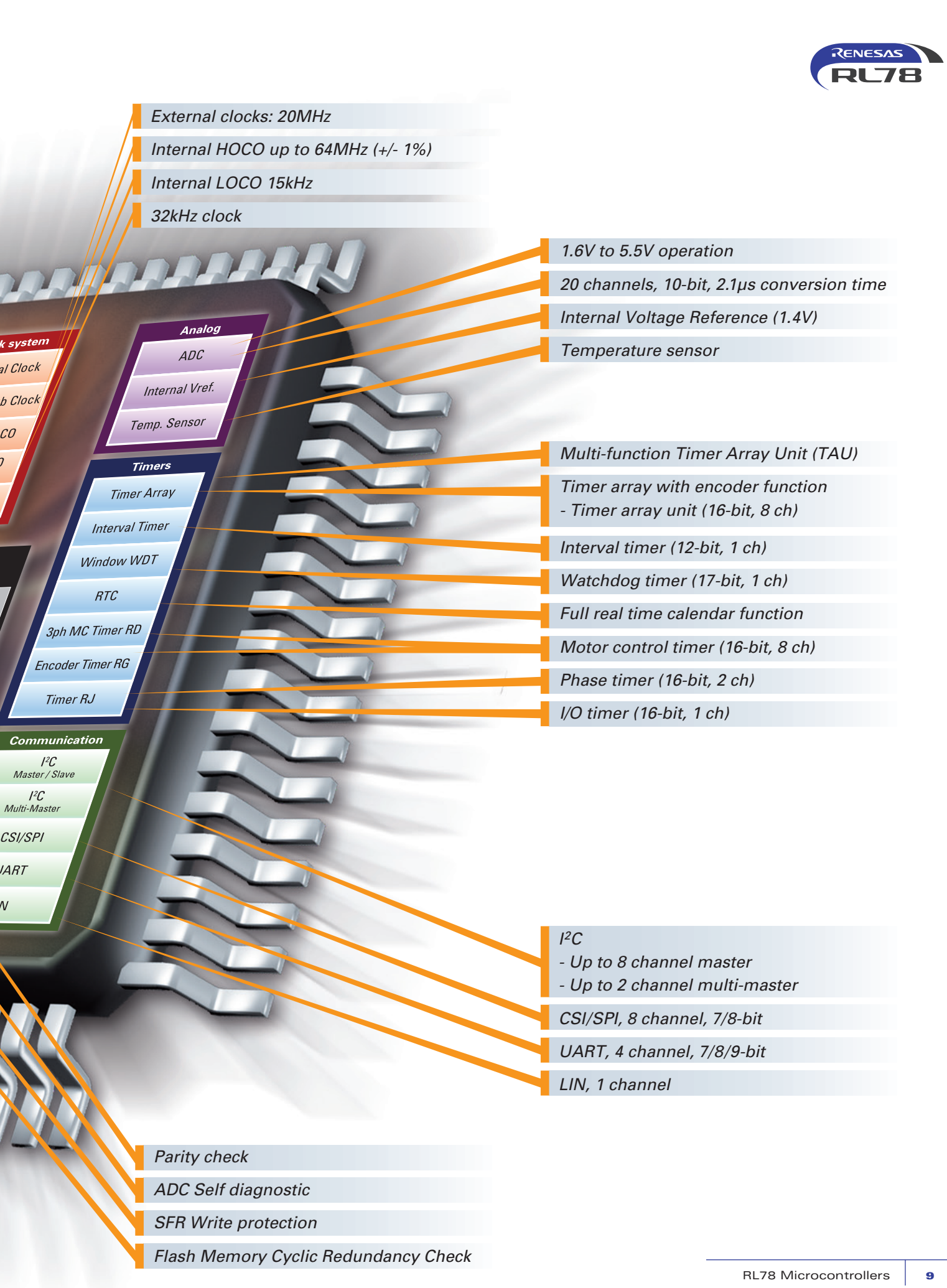
Multiple input signal selectable

- ADC measurement sources:
  - External ADC input pins
  - External / Internal AVref sources
  - Internal Vref (1.4 V typ)
  - Temperature sensor

RL78 Peripherals

RL78/G14

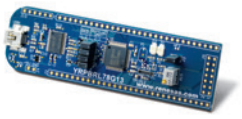



External clocks: 20MHz
Internal HOCO up to 64MHz (+/- 1%)
Internal LOCO 15kHz
32kHz clock
1.6V to 5.5V operation
20 channels, 10-bit, 2.1µs conversion time
Internal Voltage Reference (1.4V)
Temperature sensor
Analog
ADC
Internal Vref.
Temp. Sensor
Timers
Timer Array
Interval Timer
Window WDT
RTC
3ph MC Timer RD
Encoder Timer RG
Timer RJ
Multi-function Timer Array Unit (TAU)
Timer array with encoder function
- Timer array unit (16-bit, 8 ch)
Interval timer (12-bit, 1 ch)
Watchdog timer (17-bit, 1 ch)
Full real time calendar function
Motor control timer (16-bit, 8 ch)
Phase timer (16-bit, 2 ch)
I/O timer (16-bit, 1 ch)
Communication
I²C
Master / Slave
I²C
Multi-Master
I²C
- Up to 8 channel master
- Up to 2 channel multi-master
CSI/SPI, 8 channel, 7/8-bit
UART, 4 channel, 7/8/9-bit
LIN, 1 channel
Parity check
ADC Self diagnostic
SFR Write protection
Flash Memory Cyclic Redundancy Check

RL78 Development Tools

Extensive Renesas Development Ecosystem

Explore → Evaluate → Develop → Manufacture



Renesas Promotion Board

Renesas Starter Kit

Emulators: E1 (OCD), IECUBE (Full ICE)

Programmer PG-FP5, Renesas Factory

Compiler

IAR SYSTEMS

IAR Embedded Workbench (EWRL78)
Full C and C++ support,
MISRA C compliance checker

Renesas CubeSuite +

CubeSuite+

Includes CA78K0R compiler, code generator, E1/IECUBE debug plug-in support

Renesas e² studio

IAR & GNU build phase plug-in support, E1/IECUBE debug phase plug-in support

Real Time OS

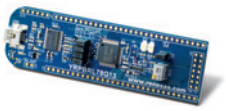
Micriμm — μC/OS-II and μC/OS-III

CMX SYSTEMS — RTX

freeRTOS

SEGGER — embOS

Development Tools and Kits



RL78/G14 RPB Board

Order No: YRPBRL78G14

- Demo the high performance of RL78
- Evaluate and measure the low power modes
- PC software included (GUI, drivers)
- IAR KickStart included (16KB code limited)
- Applilet device code generator

RL78 Starter Kits

- Allows full system development
- LCD Panel for diagnostic connection
- Program using E1 on-chip debugger
- Trial C/C++ Compiler included
- Trial CubeSuite+ IDE included
- Applilet device code generator
- Sample peripheral code

Order No:

For G13: R0K50100LS000BE
For G14: R0K50104PS000BE
For G1C: R0K5010JGS000BE
For L12: R0K5010RLS000BE
For L13: R0K5010WMS000BE
For L1C: R0K50110PS000BE

IECUBE Full in-circuit emulator

Order No: QB-RL78xxx[1]

- USB 2.0 interface
- Trace functions
- Time measurement
- Break functions
- Real-time RAM monitor function

RL78/L12 RPB Board

Order No: YRPBRL78L12

- Demo the high performance of RL78 LCD MCU
- Evaluate & measure the low power modes
- PC software included (GUI, drivers)
- e² studio IDE and KPIT GNU compiler included
- Sample code and documentation provided

E1 on-chip debugging emulator

Order No: R0E000010KCE00

- Universal Renesas on-chip debugger
- Debugger or Flash programmer interface
- Single wire connection to RL78 device
- Assembler and C source stepping
- Software and hardware breakpoints

RL78/G14 Renesas Demo Kit (RDK)

Order No: YRDKRL78G14

- RL78 MCU board with integrated debugger (USB powered)
- Sample projects exercising peripherals using sensors, display, audio speaker and on-board Wi-Fi module
- IAR Embedded Work Bench for RL78 (16KB KickStart edition) including compiler and powerful debugger

1: For complete part number, refer to Renesas web site.

RL78 Development Tools

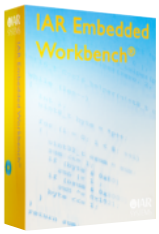
Software Development Tools

CubeSuite+

- Integrated development environment for RL78
- Includes C compiler and code generation tools
- Provides variety of tools under a consistent GUI for enhanced ease of use
- Supports other Renesas MCU family

IAR Embedded Workbench

- Integrated development environment and optimized C++ compiler for RL78
- Project management tools and editor
- Configuration files for all RL78 devices
- Emulator debugger support
- Run-time libraries



e² studio

e² studio

- Based on the popular Eclipse open-source environment
- Complete IDE supports free GNU and IAR compilers
- Powerful project management
- Download free at: sg.renesas.com/e2studio

Third-party RTOS Support

- Free of charge RTOS for download to deploy RL78 designs
- Commercial versions available as OpenRTOS

- Fast context switching time
- Nested interrupts

- µC/OS-II™ & µC/OS-III™ RTOS
- Highly efficient and ideal for safety-critical designs

- Priority controlled RTOS based on zero interrupt latency
- Optimized for minimum memory consumption in both RAM and ROM

RL78 with LCD Drive

RL78/L12 & RL78/L13 Series

The latest devices from the RL78 platform offer an integrated LCD drive. The first member in the family with an integrated LCD drive to be released is the RL78/L12.

- More segment drive for a smaller package:
  - RL78/L12 can drive 35 segment x 8 or 39 segment x 4
  - RL78/L13 can drive 47 segment x 8 com / 51 seg x 4 com
- **Low power LCD drive, only 0.68µA @ 3V with capacitor split method**
- Flexible control method: Split capacitors, capacitive charge pump or external split resistor
- Selectable functions (Seg or I/O) for every segment pin
- Drive for both A waveform and B waveform panel

Flash Memory/RAM (Byte)	32 pin	44 pin	48 pin	52 pin	64 pin	80 pin
128K					8K	8K
96K					8K	6K
64K					6K	4K
48K					2K	2K
32K	1.5K	1.5K	1.5K	1.5K	1.5K	1.5K
16K	1K	1K	1K	1K	1K	1K
8K	1K	1K	1K	1K		
Package	7x7 QFP	10x10 QFP	7x7 QFP	10x10 QFP	10x10 QFP	12x12 QFP
					12x12 QFP	14x14 QFP
					8x8 QFN	

RL78/L1x Applications

Home Automation

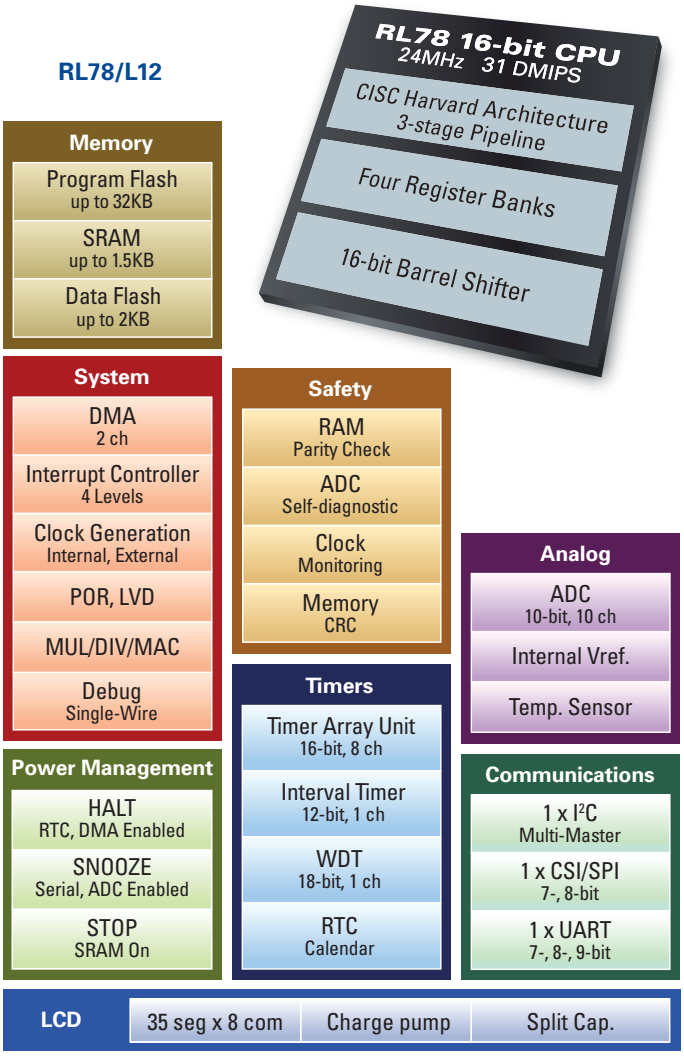
- For long battery life and operation down to 1.6V, the RL78 is the top choice

Metering

- RL78 is analog rich, ideal for smart metering applications. Renesas has three decades of metering experience

Medical

- RL78 offers true low power consumption and rich features that are ideal for portable healthcare devices. Renesas Electronics is also an active member of the Continua Alliance.



RL78 with USB

RL78/G1C Series

As the RL78 platform expands another new series of devices, the RL78/G1C adds USB connectivity. Renesas is one of the pioneers of USB, bringing the first USB 2.0 and USB 3.0 ASSPs to market. There are multiple devices in the new RL78/G1C family, adding USB 2.0 host and peripheral connectivity. New variants are planned that offer further memory expansion.

USB Battery Charging (BC1.2) Compliance

- RL78/G1C allows currents up to 1.5A to be used during charging

USB Compatibility

- Support USB standard class driver (Host/Peripheral)
- Support class: CDC/HID/MSC/PHD/etc.

Low Power & Low Cost

- Use low power and small size flash process (130µm)
- Ultra-low-power/Run operation and standby

Compact & Small

- Cover Low Pin Count (LPC) area: 32-pin to 48-pin
- Cover Small package: Body size (Min. 5x5mm), Thinness (Min. 0.75mm)

Wide Lineup

- Up to 2 USB configurable modules
  - Dual host configuration
  - 1 x Host and 1 x peripheral configuration
  - Single peripheral configuration
- Memory variation: 32KB to 128KB
- PKG variation: LQFP/QFN

Byte	32 pin	48 pin
32K Flash	5.5K 5.5K	5.5K 5.5K
PKG	QFP 7x7 QFN 5x5	QFP 7x7 QFN 7x7

2 x Host
or 1 x Host/Function

1 x only Function

All devices have 2 x 1K Data Flash

RL78/G1C Applications

Industrial

- Vending, printers and industrial meters – RL78/G1C offers USB 2.0 host/peripheral LS/FS and offers 1% accuracy OCO

Consumer

- DVD player, scanners and portable devices
- USB Battery charger – RL78/G1C offers high-speed battery charging
  - 1.5A BC1.2 compliance
  - 1.0A/2.1A MFi compliance

RL78 with Low Pin Count

RL78/G10 Series

The RL78/G10 series consists of small, highly-integrated 10- and 16-pin SSOP packaged MCUs, optimized for space-constrained, low-cost applications. Development is quick and easy with cost-effective, professional development tools and on-chip debugging capabilities.

Low pin count in small, cost-saving packages

- 10-pin 4.4x3.6mm SSOP, 16-pin 4.4x5.0mm SSOP

8, 14 I/Os available (10-, 16-pin)

- All pins other than the V_{DD}/V_{SS} pin can be used for I/Os

Small Flash memory size

- 1-4KB flash memory

Serial communications

- I²C, CSI/SPI, UART

Flash Memory (KB)	RL78/G10 Ram (Byte)	
	10-pin SSOP 4.4x3.6	16-pin SSOP 4.4x5.0
4	512*	512*
2	256	256*
1	128	128*

Timer functions

- Multi-function Timer Array Unit, Up to 3 PWM outputs, Clock Output/Buzzer Output, Watchdog

System cost reduction with integrated features

- 20MHz on-chip oscillator +/- 2%
- 15kHz low-speed on-chip oscillator
- SPOR for Low Voltage Reset
- SHA-1 library available

Power management

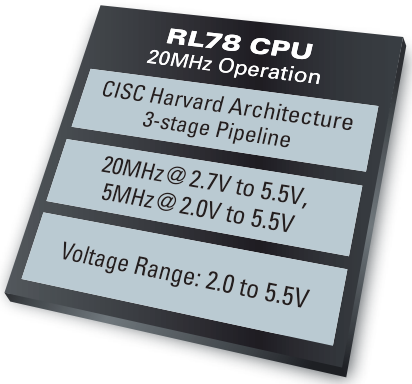
- Run: as low as 46µA/MHz**
- Stop: 0.56µA (RAM retained) w/SPOR

* Under development

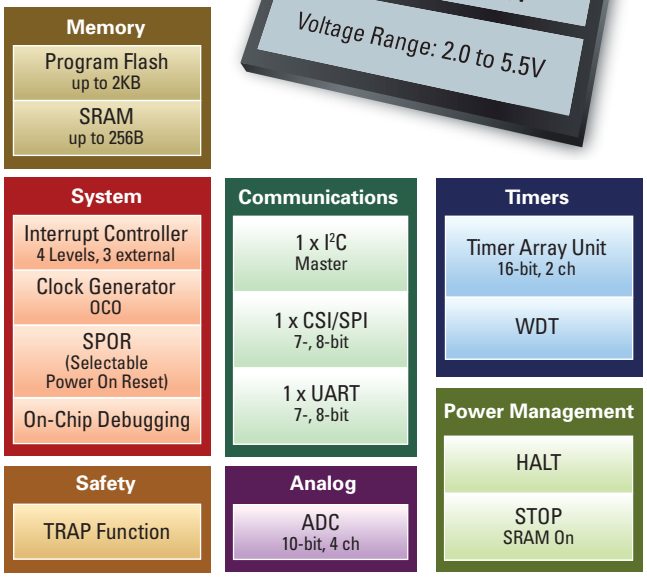
** Basic power consumption (NOP operation)

RL78/G10 Applications

- Consumer/Small Appliances
- Healthcare
- Industrial
- Charger, Discrete replacement



RL78/G10
(10-pin)



RL78 Device Selector Table

Device		Memory		Interfaces				Peripherals								Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Con-verter	DMA	Supply Voltage (V)	Packages
RL78/G10	R5F10Y14	1K	128	8	Up to 1 serial channel: 1 x UART, 1 x CSI, 1 x I²C	–	–	WDT	1	20	20MHz 15kHz	–	4x 10-bit/-	–	2.0 – 5.5	10-pin SSOP 4.4 x 3.6
	R5F10Y16	2K	256													
	R5F10Y17*	4K	512													
	R5F10Y44*	1K	128	14	Up to 2 serial channel: 1 x UART, 2 x CSI, 1 x I2C and 1 x Multi-Master I2C	–	–	Interval timer x 1ch (15kHz), WDT	3	20	20MHz 15kHz	–	7x 10-bit/-	–	2.0 – 5.5	16-pin SSOP 4.4 x 5.0
	R5F10Y46*	2K	256													
	R5F10Y47*	4K	512													
RL78/G1C	R5F10JBC	32K + 2K	5.5K	22	Up to 2 serial channel: 1 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	2	Interval timer x 1ch (15kHz) RTC with calender, WDT	3	24	24MHz 15kHz	–	8x 10-bit/-	2	2.4 – 5.5	32-pin, 7x7 LQFP 5x5 WQFN
	R5F10KBC	32K + 2K	5.5K				1									
	R5F10JGC	32K + 2K	5.5K	38		–	2	Interval timer x 1ch (15kHz /32.768kHz) RTC w/cal., WDT	3	24	24MHz 15kHz	–	8x 10-bit/-	2	2.4 – 5.5	48-pin, 7x7 LQFP 7x7 WQFN
	R5F10KGC	32K + 2K	5.5K				1									
RL78/G12	R5F10266	2K + 2K	256	18	Up to 2 serial channel: 1 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	11x 10-bit/-	2ch	1.8 – 5.5	20-pin SSOP
	R5F10267	4K + 2K	512													
	R5F10268	8K + 2K	768													
	R5F10269	12K + 2K	1K													
	R5F1026A	16K + 2K	1.5K													
	R5F10366	2K	256	18	Up to 2 serial channel: 1 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	11x 10-bit/-	2ch	1.8 – 5.5	20-pin SSOP
	R5F10367	4K	512													
	R5F10368	8K	768													
	R5F10369	12K	1K													
	R5F1036A	16K	1.5K													
	R5F10277	4K + 2K	512	22	Up to 2 serial channel: 1 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	11x 10-bit/-	2ch	1.8 – 5.5	24-pin 4x4 WQFN
	R5F10278	8K + 2K	768													
	R5F10279	12K + 2K	1K													
	R5F1027A	16K + 2K	1.5K													
	R5F10377	4K	512	22	Up to 2 serial channel: 1 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	11x 10-bit/-	2ch	1.8 – 5.5	24-pin 4x4 WQFN
	R5F10378	8K	768													
	R5F10379	12K	1K													
	R5F1037A	16K	1.5K													

Device		Memory		Interfaces				Peripherals							Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Converter	DMA	Supply Voltage (V)	Packages
RL78/G12	R5F102A7	4K + 2K	512	26	Up to 3 serial channel: 3 x UART, 3 x CSI, 3 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	8x 10-bit/-	2ch	1.8 – 5.5	30-pin SSOP
	R5F102A8	8K + 2K	768													
	R5F102A9	12K + 2K	1K													
	R5F102AA	16K + 2K	2K													
	R5F103A7	4K	512	26	Up to 3 serial channel: 3 x UART, 3 x CSI, 3 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) WDT	4	24	24MHz 15kHz	–	8x 10-bit/-	2ch	1.8 – 5.5	30-pin SSOP
	R5F103A8	8K	768													
	R5F103A9	12K	1K													
	R5F103AA	16K	2K													
RL78/G13	R5F1006A	16K + 4K	2K	16	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	2	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	20-pin SSOP
	R5F1006C	32K + 4K	2K													
	R5F1006D	48K + 4K	3K													
	R5F1006E	64K + 4K	4K													
	R5F1016A	16K	2K	16	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	2	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	20-pin SSOP
	R5F1016C	32K	2K													
	R5F1016D	48K	3K													
	R5F1016E	64K	4K													
	R5F1007A	16K + 4K	2K	20	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	24-pin 4x4 WQFN
	R5F1007C	32K + 4K	2K													
	R5F1007D	48K + 4K	3K													
	R5F1007E	64K + 4K	4K													
	R5F1017A	16K	2K	20	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	24-pin 4x4 WQFN
	R5F1017C	32K	2K													
	R5F1017D	48K	3K													
	R5F1017E	64K	4K													
	R5F1008A	16K + 4K	2K	21	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	25-pin 3 x 3 FLGA
	R5F1008C	32K + 4K	2K													
	R5F1008D	48K + 4K	3K													
	R5F1008E	64K + 4K	4K													
	R5F1018A	16K	2K	21	Up to 2 serial channel: 2x UART, 2 x CSI, 2 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	6x 10-bit/-	2ch	1.6 – 5.5	25-pin 3 x 3 FLGA
	R5F1018C	32K	2K													
	R5F1018D	48K	3K													
	R5F1018E	64K	4K													
	R5F100AA	16K + 4K	2K	26	Up to 3 serial channel: 3x UART, 3 x CSI, 3 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	30-pin SSOP
	R5F100AC	32K + 4K	2K													
	R5F100AD	48K + 4K	3K													
	R5F100AE	64K + 4K	4K													
	R5F100AF	96K + 8K	8K													
	R5F100AG	128K + 8K	12K													
	R5F100BA	16K + 4K	2K	26	Up to 3 serial channel: 3x UART, 3 x CSI, 3 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	30-pin SSOP
	R5F100BC	32K + 4K	2K													
	R5F100BD	48K + 4K	3K													
	R5F100BE	64K + 4K	4K													
	R5F100BF	96K + 8K	8K													
	R5F100BG	128K + 8K	12K													
	R5F101BA	16K	2K	28	Up to 3 serial channel: 3x UART, 3 x CSI, 3 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	32-pin 5x5 QFN
	R5F101BC	32K	2K													
	R5F101BD	48K	3K													
	R5F101BE	64K	4K													
	R5F101BF	96K	8K													
	R5F101BG	128K	12K													
	R5F100CA	16K + 4K	2K	28	Up to 3 serial channel: 3x UART, 3 x CSI, 3 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	32-pin 5x5 QFN
	R5F100CC	32K + 4K	2K													
	R5F100CD	48K + 4K	3K													
	R5F100CE	64K + 4K	4K													
	R5F100CF	96K + 8K	8K													
	R5F100CG	128K + 8K	12K													
	R5F101CA	16K	2K	32	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	36-pin 4x4 FLGA
	R5F101CC	32K	2K													
	R5F101CD	48K	3K													
	R5F101CE	64K	4K													
	R5F101CF	96K	8K													
	R5F101CG	128K	12K													
	R5F101CA	16	2K	32	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	8x 10-bit/-	2ch	1.6 – 5.5	36-pin 4x4 FLGA
	R5F101CC	32	2K													
	R5F101CD	48	3K													
	R5F101CE	64	4K													
	R5F101CF	96	8K													
	R5F101CG	128	12K													

Device		Memory		Interfaces				Peripherals							Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Converter	DMA	Supply Voltage (V)	Packages
RL78/G13	R5F100EA	16K + 4K	2K	36	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	9x 10-bit/-	2ch	1.6 – 5.5	40-pin 6 x 6 WQFN
	R5F100EC	32K + 4K	2K													
	R5F100ED	48K + 4K	3K													
	R5F100EE	64K + 4K	4K													
	R5F100EF	96K + 8K	8K													
	R5F100EG	128K + 8K	12K													
	R5F100EH	192K + 8K	16K													
	R5F101EA	16K	2K	36	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	3	32	32MHz 15kHz	–	9x 10-bit/-	2ch	1.6 – 5.5	40-pin 6 x 6 WQFN
	R5F101EC	32K	2K													
	R5F101ED	48K	3K													
	R5F101EE	64K	4K													
	R5F101EF	96K	8K													
	R5F101EG	128K	12K													
	R5F101EH	192K	16K													
	R5F100FA	16K + 4K	2K	40	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	10x 10-bit/-	2ch	1.6 – 5.5	44-pin 10x10 LQFP
	R5F100FC	32K + 4K	2K													
	R5F100FD	48K + 4K	3K													
	R5F100FE	64K + 4K	4K													
	R5F100FF	96K + 8K	8K													
	R5F100FG	128K + 8K	12K													
	R5F100FH	192K + 8K	16K													
	R5F100FJ	256K + 8K	20K													
	R5F100FK	384K + 8K	24K													
	R5F100FL	512K + 8K	32K													
	R5F101FA	16K	2K	40	Up to 4 serial channel: 3x UART, 4 x CSI, 4 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	10x 10-bit/-	2ch	1.6 – 5.5	44-pin 10x10 LQFP
	R5F101FC	32K	2K													
	R5F101FD	48K	3K													
	R5F101FE	64K	4K													
	R5F101FF	96K	8K													
	R5F101FG	128K	12K													
	R5F101FH	192K	16K													
	R5F101FJ	256K	20K													
	R5F101FK	384K	24K													
	R5F101FL	512K	32K													
	R5F100GA	16K + 4K	2K	44	Up to 5 serial channel: 3x UART, 5 x CSI, 5 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	10x 10-bit/-	2ch	1.6 – 5.5	48-pin 7x7 LQFP 7x7 WQFN
	R5F100GC	32K + 4K	2K													
	R5F100GD	48K + 4K	3K													
	R5F100GE	64K + 4K	4K													
	R5F100GF	96K + 8K	8K													
	R5F100GG	128K + 8K	12K													
	R5F100GH	192K + 8K	16K													
	R5F100GJ	256K + 8K	20K													
	R5F100GK	384K + 8K	24K													
	R5F100GL	512K + 8K	32K													
	R5F101GA	16K	2K	44	Up to 5 serial channel: 3x UART, 5 x CSI, 5 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	10x 10-bit/-	2ch	1.6 – 5.5	48-pin 7x7 LQFP 7x7 WQFN
	R5F101GC	32K	2K													
	R5F101GD	48K	3K													
	R5F101GE	64K	4K													
	R5F101GF	96K	8K													
	R5F101GG	128K	12K													
	R5F101GH	192K	16K													
	R5F101GJ	256K	20K													
	R5F101GK	384K	24K													
	R5F101GL	512K	32K													
	R5F100JC	32K + 4K	2K	48	Up to 5 serial channel: 3x UART, 5 x CSI, 5 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	12x 10-bit/-	2ch	1.6 – 5.5	52-pin 10x10 LQFP
	R5F100JD	48K + 4K	3K													
	R5F100JE	64K + 4K	4K													
	R5F100JF	96K + 8K	8K													
	R5F100JG	128K + 8K	12K													
	R5F100JH	192K + 8K	16K													
	R5F100JJ	256K + 8K	20K													
	R5F100JK	384K + 8K	24K													
	R5F100JL	512K + 8K	32K													

Device		Memory		Interfaces				Peripherals							Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Converter	DMA	Supply Voltage (V)	Packages
RL78/G13	R5F101JC	32K	2K	48	Up to 5 serial channel: 3x UART, 5 x CSI, 5 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	4	32	32MHz 15kHz	–	12x 10-bit/-	2ch	1.6 – 5.5	52-pin 10x10 LQFP
	R5F101JD	48K	3K													
	R5F101JE	64K	4K													
	R5F101JF	96K	8K													
	R5F101JG	128K	12K													
	R5F101JH	192K	16K													
	R5F101JJ	256K	20K													
	R5F101JK	384K	24K													
	R5F101JL	512K	32K													
	R5F100LC	32K + 4K	2K	58	Up to 6 serial channel: 3x UART, 6 x CSI, 6 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	7	32	32MHz 15kHz	–	12x 10-bit/-	2ch	1.6 – 5.5	64-pin 7x7 LQFP 10x10 LQFP 12x12 LQFP 4x4 FBGA
	R5F100LD	48K + 4K	3K													
	R5F100LE	64K + 4K	4K													
	R5F100LF	96K + 8K	8K													
	R5F100LG	128K + 8K	12K													
	R5F100LH	192K + 8K	16K													
	R5F100LJ	256K + 8K	20K													
	R5F100LK	384K + 8K	24K													
	R5F100LL	512K + 8K	32K													
	R5F101LC	32K	2K	58	Up to 6 serial channel: 3x UART, 6 x CSI, 6 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	7	32	32MHz 15kHz	–	12x 10-bit/-	2ch	1.6 – 5.5	64-pin 7x7 LQFP 10x10 LQFP 12x12 LQFP 4x4 FBGA
	R5F101LD	48K	3K													
	R5F101LE	64K	4K													
	R5F101LF	96K	8K													
	R5F101LG	128K	12K													
	R5F101LH	192K	16K													
	R5F101LJ	256K	20K													
	R5F101LK	384K	24K													
	R5F101LL	512K	32K													
	R5F100MF	96K + 8K	8K	74	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	10	32	32MHz 15kHz	–	17x 10-bit/-	2ch	1.6 – 5.5	80-pin 12x12 LQFP 14x14 LQFP
	R5F100MG	128K + 8K	12K													
	R5F100MH	192K + 8K	16K													
	R5F100MJ	256K + 8K	20K													
	R5F100MK	384K + 8K	24K													
	R5F100ML	512K + 8K	32K													
	R5F101MF	96K	8K	74	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	10	32	32MHz 15kHz	–	17x 10-bit/-	2ch	1.6 – 5.5	80-pin 12x12 LQFP 14x14 LQFP
	R5F101MG	128K	12K													
	R5F101MH	192K	16K													
	R5F101MJ	256K	20K													
	R5F101MK	384K	24K													
	R5F101ML	512K	32K													
	R5F100PF	96K + 8K	8K	92	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	12	32	32MHz 15kHz	–	20x 10-bit/-	2ch	1.6 – 5.5	100-pin 12x12 LQFP 14x20 LQFP
	R5F100PG	128K + 8K	12K													
	R5F100PH	192K + 8K	16K													
	R5F100PJ	256K + 8K	20K													
	R5F100PK	384K + 8K	24K													
	R5F100PL	512K + 8K	32K													
	R5F101PF	96K	8K	92	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	12	32	32MHz 15kHz	–	20x 10-bit/-	2ch	1.6 – 5.5	100-pin 12x12 LQFP 14x20 LQFP
	R5F101PG	128K	12K													
	R5F101PH	192K	16K													
	R5F101PJ	256K	20K													
	R5F101PK	384K	24K													
	R5F101PL	512K	32K													
	R5F100SH	192K + 8K	16K	120	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	16	32	32MHz 15kHz	–	26x 10-bit/-	2ch	1.6 – 5.5	128-pin 14 x 20 LQFP
	R5F100SJ	256K + 8K	20K													
	R5F100SK	384K + 8K	24K													
	R5F100SL	512K + 8K	32K													
	R5F101SH	192K	16K	120	Up to 8 serial channel: 4 x UART, 8 x CSI, 8 x SPI	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	16	32	32MHz 15kHz	–	26x 10-bit/-	2ch	1.6 – 5.5	128-pin 14 x 20 LQFP
	R5F101SJ	256K	20K													
	R5F101SK	384K	24K													
	R5F101SL	512K	32K													
RL78/G14	R5F104AA	16K + 4K	2.5K	26	Up to 3 serial channel: 3 x UART, 3x CSI, 3x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	8x 10-bit/ 1x 8-bit	DTC 31 sources	1.6 – 5.5	30-pin SSOP
	R5F104AC	32K + 4K	4K													
	R5F104AD	48K + 4K	5.5K													
	R5F104AE	64K + 4K	5.5K													
	R5F104AF	96K + 8K	12K													
	R5F104AG	128K + 8K	16K													
	R5F104BA	16K + 4K	2.5K	28	Up to 3 serial channel: 3 x UART, 3x CSI, 3x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	8x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	32-pin 5 x5 WQFN 7x7LQFP
	R5F104BC	32K + 4K	4K													
	R5F104BD	48K + 4K	5.5K													
	R5F104BE	64K + 4K	5.5K													
	R5F104BF	96K + 8K	12K													
	R5F104BG	128K + 8K	16K													

Device		Memory		Interfaces				Peripherals							Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Converter	DMA	Supply Voltage (V)	Packages
RL78/G14	R5F104CA	16K + 4K	2.5K	32	Up to 4 serial channel: 3 x UART, 4x CSI, 4x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	8x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	36-pin 4x4FLGA
	R5F104CC	32K + 4K	4K													
	R5F104CD	48K + 4K	5.5K													
	R5F104CE	64K + 4K	5.5K													
	R5F104CF	96K + 8K	12K													
	R5F104CG	128K + 8K	16K													
	R5F104EA	16K + 4K	2.5K	36	Up to 4 serial channel: 3 x UART, 4x CSI, 4x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	9x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	40-pin 6x6WQFN
	R5F104EC	32K + 4K	4K													
	R5F104ED	48K + 4K	5.5K													
	R5F104EE	64K + 4K	5.5K													
	R5F104EF	96K + 8K	12K													
	R5F104EG	128K + 8K	16K													
	R5F104FG	192K + 8K	20K													
	R5F104FA	16K + 4K	2.5K	40	Up to 4 serial channel: 3 x UART, 4x CSI, 4x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	10x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	44-pin 10x10 LQFP
	R5F104FC	32K + 4K	4K													
	R5F104FD	48K + 4K	5.5K													
	R5F104FE	64K + 4K	5.5K													
	R5F104FF	96K + 8K	12K													
	R5F104FG	128K + 8K	16K													
	R5F104FH	192K + 8K	20K													
	R5F104FJ	256K + 8K	24K													
	R5F104GA	16K + 4K	2.5K	44	Up to 5 serial channel: 3 x UART, 5x CSI, 5x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	10x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	48-pin 7x7 LQFP 7x7 WQFN
	R5F104GC	32K + 4K	4K													
	R5F104GD	48K + 4K	5.5K													
	R5F104GE	64K + 4K	5.5K													
	R5F104GF	96K + 8K	12K													
	R5F104GG	128K + 8K	16K													
	R5F104GH	192K + 8K	20K													
	R5F104GJ	256K + 8K	24K													
	R5F104JC	32K + 4K	4K	48	Up to 5 serial channel: 3 x UART, 5x CSI, 5x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	12x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	52-pin 10x10 LQFP
	R5F104JD	48K + 4K	5.5K													
	R5F104JE	64K + 4K	5.5K													
	R5F104JF	96K + 8K	12K													
	R5F104JG	128K + 8K	16K													
	R5F104JH	192K + 8K	20K													
	R5F104JJ	256K + 8K	24K													
	R5F104LC	32K + 4K	4K	58	Up to 6 serial channel: 3 x UART, 6x CSI, 6x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	10	32	64MHz 15kHz	–	12x 10-bit/ 2x 8-bit	DTC 31 sources	1.6 – 5.5	64-pin 10x10 LQFP 12x12 LQFP 14x14 LQFP 5x5 FLGA
	R5F104LD	48K + 4K	5.5K													
	R5F104LE	64K + 4K	5.5K													
	R5F104LF	96K + 8K	12K													
	R5F104LG	128K + 8K	16K													
	R5F104LH	192K + 8K	20K													
	R5F104LJ	256K + 8K	24K													
	R5F104MF	96K + 8K	12K	74	Up to 8 serial channel: 4 x UART, 8x CSI, 8x I²C and 2 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	13	32	64MHz 15kHz	–	17x 10-bit/ 2x 8-bit	DTC 39 sources	1.6 – 5.5	80-pin 12x12 LQFP 14x14 LQFP
	R5F104MG	128K + 8K	16K													
	R5F104MH	192K + 8K	20K													
	R5F104MJ	256K + 8K	24K													
	R5F104PF	96K + 8K	12K	92	Up to 8 serial channel: 4 x UART, 8x CSI, 8x I²C and 2 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer 3ph Motor Control Timer	13	32	64MHz 15kHz	–	20x 10-bit/ 2x 8-bit	DTC 39 sources	1.6 – 5.5	100-pin 14x14 LQFP 14x20 LQFP
	R5F104PG	128K + 8K	16K													
	R5F104PH	192K + 8K	20K													
	R5F104PJ	256K + 8K	24K													
RL78/G1A	R5F10E8A	16K + 4K	2K	19	Up to 2 serial channel: 2 x UART, 2 x CSI, 2 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer	1	32	32MHz 15kHz	–	13x 12-bit/-	2ch	1.6 – 3.6	25-pin 3 x 3 FLGA
	R5F10E8C	32K + 4K	2K													
	R5F10E8D	48K + 4K	3K													
	R5F10E8E	64K + 4K	4K													
	R5F10EBA	16K + 4K	2K	26	Up to 3 serial channel: 3 x UART, 3 x CSI, 3 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender Watchdog Timer	1	32	32MHz 15kHz	–	18x 12-bit/-	2ch	1.6 – 3.6	32-pin 5 x 5 WQFN
	R5F10EBC	32K + 4K	2K													
	R5F10EBD	48K + 4K	3K													
	R5F10EBE	64K + 4K	4K													
	R5F10EGA	16K + 4K	2K	44	Up to 5 serial channel: 3 x UART, 5 x CSI, 5 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer	3	32	32MHz 15kHz	–	24x 12-bit/-	2ch	1.6 – 3.6	48-pin 7 x 7 LQFP 7 x7 WQFN
	R5F10EGC	32K + 4K	2K													
	R5F10EGD	48K + 4K	3K													
	R5F10EGE	64K + 4K	4K													
	R5F10ELA	16K + 4K	2K	56	Up to 6 serial channel: 3 x UART, 6 x CSI, 6 x I²C and 1 x Multi-Master I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender Watchdog Timer	6	32	32MHz 15kHz	–	28x 12-bit/-	2ch	1.6 – 3.6	64-pin 10 x 10 LQFP 4 x 4 FBGA
	R5F10ELC	32K + 4K	2K													
	R5F10ELD	48K + 4K	3K													
	R5F10ELE	64K + 4K	4K													

Device		Memory		Interfaces				Peripherals							Miscellaneous	
Group	Part Number	Flash and Data Flash (Byte)	RAM (Byte)	I/O/Pins	CSI/ UARTs (LIN)/ I²C	CAN	USB	Special Timers	PWMs	Clock Speed (MHz)	Internal Oscillator(s)	LCD Control	A/D / D/A-Con-verter	DMA	Supply Voltage (V)	Packages
RL78/I1A (ASSP)	R5F1076C	32K + 4K	2K	16	1 x UART/ DMX512, 1 x UART/DALI, I²C	–	–	Interval timer x 1ch Watchdog 16-bit Burst Dimmer	7	32	64MHz 15kHz	–	6 /-	2ch	2.7 – 5.5	20-pin SSOP 6.1x6.5mm; 0.65
	R5F107AE	32K + 4K	2K	26	2 x UART/ DMX512, 1 x UART/DALI, I²C	–	–	Interval timer x 1ch Watchdog 16-bit Burst Dimmer	13	32	64MHz 15kHz	–	11 /-	2ch	2.7 – 5.5	30-pin SSOP 6.1x9.7mm; 0.65
	R5F107AC	64K + 4K	4K													
	R5F107DE	32K + 4K	4K	34	2 x UART/ DMX512, 1 x CSI, 1 x UART/DALI, I²C	–	–	Interval timer x 1ch Watchdog 16-bit Burst Dimmer	15	32	64MHz 15kHz	–	11 /-	2ch	2.7 – 5.5	38-pin SSOP 6.1x12.3mm; 0.65
RL78/L12	R5F10RB8	8K + 2K	1K	20	Up to 2 serial channel: 1 x UART, 2x CSI, 1 x I²C	–	–	Interval timer x 1ch (15kHz) RTC with calender, WDT	3	24	24MHz 15kHz	35x8	4 x 10-bit	2ch	1.6 – 5.5	32-pin 7 x7 LQFP
	R5F10RBA	16K + 2K	1K													
	R5F10RBC	32K + 2K	1.5K													
	R5F10RF8	8K + 2K	1K	29	Up to 2 serial channel: 1 x UART, 2x CSI, 1 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender, WDT	4	24	24MHz 15kHz	35x8	7 x 10-bit	2ch	1.6 – 5.5	44-pin 10 x 10 LQFP
	R5F10RFA	16K + 2K	1K													
	R5F10RFC	32K + 2K	1.5K													
	R5F10RG8	8K + 2K	1K	33	Up to 2 serial channel: 1 x UART, 2x CSI, 1 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender, WDT	5	24	24MHz 15kHz	35x8	9 x 10-bit	2ch	1.6 – 5.5	48-pin 7 x 7 LQFP
	R5F10RGA	16K + 2K	1K													
	R5F10RGC	32K + 2K	1.5K													
	R5F10RJ8	8K + 2K	1K	37	Up to 2 serial channel: 1 x UART, 2x CSI, 1 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender, WDT	7	24	24MHz 15kHz	35x8	10 x 10-bit	2ch	1.6 – 5.5	52-pin 10 x 10 LQFP
	R5F10RJA	16K + 2K	1K													
	R5F10RJC	32K + 2K	1.5K													
	R5F10RLA	16K + 2K	1K	47	Up to 2 serial channel: 1 x UART, 2x CSI, 1 x I²C	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender, WDT	7	24	24MHz 15kHz	35x8	10 x 10-bit	2ch	1.6 – 5.5	64-pin 8 x 8 WQFN 10 x 10 LQFP 12 x 12 LQFP
	R5F10RLC	32K + 2K	1.5K													
RL78/L13	R5F10WLA	16K+2K	1K	49	Up to 3 serial channel: 2x UART/CSI/simple I²C, 1 x I²C Multi-Master, 1xUART	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	10	24	48MHz 15kHz	48x8	12x 10-bit/ 2x 8-bit	2ch	1.6 – 5.5	64-pin LQFP 10x10 LQFP 12x12
	R5F10WLC	32K+2K	1.5K													
	R5F10WLD	48K+2K	2K													
	R5F10WLE	64K+2K	4K													
	R5F10WLF	96K+2K	6K													
	R5F10WLG	128K+2K	8K													
	R5F10WMA	16K+2K	1K	65	Up to 4 serial channel: 2x UART/CSI/simple I²C, 1 x I²C Multi-Master, 2xUART	–	–	Interval timer x 1ch (15kHz/32.768kHz) RTC with calender WDT	10	24	48MHz 15kHz	48x8	12x 10-bit/ 2x 8-bit	2ch	1.6 – 5.5	80-pin LQFP 12x12 LQFP 14x14
	R5F10WMC	32K+2K	1.5K													
	R5F10WMD	48K+2K	2K													
	R5F10WME	64K+2K	4K													
	R5F10WMF	96K+2K	6K													
	R5F10WMG	128K+2K	8K													
RL78/L1C	R5F110ME	64K+8K	8K	59	Up to 4 serial channel: 4 x UART/CSI/simple I2C and 1 x Multi-Master I2C	–	1	Interval timer x 1ch (15kHz/32.768kHz), RTC with calender, WDT	13	24	48MHz 15kHz	40x8	9x 12-bit/ 2x 8-bit	DTC 32 sources	1.6 – 3.6	80-pin LQFP 12x12
	R5F110MF	96K+8K	10K													
	R5F110MG	128K+8K	12K													
	R5F110MH	192K+8K	16K													
	R5F110MJ	256K+8K	16K													
	R5F110PE	64K+8K	8K	77	Up to 4 serial channel: 4 x UART/CSI/simple I2C and 1 x Multi-Master I2C	–	1	Interval timer x 1ch (15kHz/32.768kHz), RTC with calender, WDT	13	24	48MHz 15kHz	52x8	13x 12-bit/ 2x 8-bit	DTC 33 sources	1.6 – 3.6	100-pin LQFP 14x14
	R5F110PF	96K+8K	10K													
	R5F110PG	128K+8K	12K													
	R5F110PH	192K+8K	16K													
	R5F110PJ	256K+8K	16K													
	R5F111ME	64K+8K	8K	63	Up to 4 serial channel: 4 x UART/CSI/simple I2C and 1 x Multi-Master I2C	–	–	Interval timer x 1ch (15kHz/32.768kHz), RTC with calender, WDT	13	24	48MHz 15kHz	40x8	9x 12-bit/ 2x 8-bit	DTC 30 sources	1.6 – 3.6	80-pin LQFP 12x12
	R5F111MF	96K+8K	10K													
	R5F111MG	128K+8K	12K													
	R5F111MH	192K+8K	16K													
	R5F111MJ	256K+8K	16K													
	R5F111PE	64K+8K	8K	81	Up to 4 serial channel: 4 x UART/CSI/simple I2C and 1 x Multi-Master I2C	–	–	Interval timer x 1ch (15kHz/32.768kHz), RTC with calender, WDT	13	24	48MHz 15kHz	52x8	13x 12-bit/ 2x 8-bit	DTC 31 sources	1.6 – 3.6	100-pin LQFP 14x14
	R5F111PF	96K+8K	10K													
	R5F111PG	128K+8K	12K													
	R5F111PH	192K+8K	16K													
	R5F111PJ	256K+8K	16K													

Part Number Guide

Example shown here: RL78/G13 (20-pin), Part number R5F1006EASP#V0

R5 F 1 00 6 E □ A SP #V 0

- R5: Renesas MCU
- F: ROM Type (F = Flash)
- 1: RL78 Series
- 00: Product Group
- 6: Pin Count
- E: ROM Size (KB)
- □: Rev. (Optional)
- A: Temperature & Quality Grade
- SP: Package
- #V: Packaging, Material (Pb-free)
- 0: Production Level

Product Group

00	G13	Data Flash
01	G13	No Data Flash
02	G12	Data Flash
03	G12	No Data Flash
04	G14	Data Flash
07	I1A	Data Flash
0E	G1A	Data Flash
0J	G1C	Data Flash
0K	G1C	Data Flash
0R	L12	Data Flash
0W	L13	Data Flash
0Y	G10	No Data Flash
10	L1C	Data Flash
11	L1C	Data Flash

Pin Count

1	10
6	20
7	24
8	25
A	30
B	32
C	36
D	38
E	40
F	44
G	48
J	52
L	64
M	80
P	100
S	128

ROM Size (KB)

4	1
6	2
7	4
8	8
9	12
A	16
C	32
D	48
E	64
F	96
G	128
H	192
J	256
K	384
L	512

Temperature & Quality Grade

A	-40°C to +85°C	(Consumer)
D	-40°C to +85°C	(Industrial)
G	-40°C to +105°C	(Industrial)
J	-40°C to +85°C	(Automotive)
K	-40°C to +125°C	(Automotive)

Package

SP	SSOP	FP	QFP
NA	QFN	FB	QFP 0.5mm
LA	LGA	FA	QFP 0.65mm
BG	BGA 0.4mm	FC	QFP 0.4mm

Packaging, Material (Pb-free)

#Y	Tray	–	Pre-MP
#V, #3	Tray	Sn (Tin) only	MP
#U	Tray	SnCu and others	MP
#X, #5	T&R	Sn (Tin) only	MP
#W	T&R	SnCu and others	MP

Production Level

W	WS (Working Sample)
E	ES (Engineering Sample)
C	CS (Consumer Sample)
0	MP (Mass Production)

Getting Started with RL78 MCUs is Easy!

Renesas Electronics has made embedded design with the RL78 microcontroller family as easy as possible.

An extensive ecosystem for RL78, including training, free evaluation boards (Renesas Promotion Boards), low-cost starter kits and multiple application notes, aid the embedded system designer to develop the world's lowest power designs.

sg.renesas.com/RL78

- Keep up to date with the RL78 Family
- RL78 MCU search facility
- Full data & application notes
- Hardware and software guides and free downloads
- Sales and support information

Low Power

Scalable RL78

Efficient

RL78 Promotion Board

- Learn about RL78 key features
- A complete GUI based control
- Software examples
- Development environment

Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

RENESAS

sg.renesas.com

Renesas Electronics Singapore Pte.Ltd. | Tel: +65 6213 0200
80 Bendemeer Road #06-02 Hyflux Innovation Centre, Singapore 339949.

Renesas Electronics Malaysia Sdn. Bhd. | Tel: +60 3 7955 9390
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, Petaling Jaya, 46050 Selangor, Malaysia.

Renesas Electronics Singapore Pte. Ltd. India Branch | Tel: +91 80 6720 8700
777C, 100 Feet Road, HAL II Stage, Indiranagar, Bangalore 560038, India

Find us on Facebook — facebook.com/RenesasSingapore

YouTube — youtube.com/RenesasPresents

MyRenesas — sg.renesas.com/MyRenesas/

RenesasRulz.com — RenesasRulz.com

Renesas Interactive — RenesasInteractive.com