RENESAS

RL78/L12
The True Low Power LCD Microcontroller Platform

RENESAS RL78

NEW !

RL78

RL78 The True Low Power Microcontroller Platform

RL78 from Renesas Electronics is an advanced family of 16-bit general purpose and application specific microcontrollers (MCU's) combining true low power and high performance operation.
The RL78 is designed specifically for ultra low power applications. RL78's 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 board security features

An extensive ecosystem and more details of RL78 can be found at **www.Renesas.com/RL78**

Extensive Ecosystem
> Advanced development tools
> 3rd party support
> Online resources
> Online training: Renesas interactive

High Quality & Safety
> Flash memory with ECC
> Safety support includes IEC 60730
> High temperature support: -20⁰ to 105⁰

True Low Power
> 63 uA/MHz Operation
> 0.57 uA (RTC + LVD)
> Unique "Snooze" mode

System Cost Reduction
> 32/64 MHz +/-1% OCO
> On-chip low voltage detection circuit
> Data flash with BGO

Broad Scalability
> 20 to 128 pins
> 2 KB to 512 KB Flash
> 100% compatibility
> Peripheral I/O re-direction capability

High Efficiency
> Up to 1.39 DMIPS/MHz
> 1.6V to 5.5 V operation*
> DMA/DTC/ELC*

RL78 Now With LCD Drive

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

> More segment drive for a smaller package: RL78/L12 can drive 35segment x 8 or 39 segment x 4

> Low power LCD drive, only 0.6 uA @ 3 V 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 glass and B waveform panel

RL78/L12 Applications

> Home Automation: For long battery life and operation down to 1.6 V RL78 is the first choice

> Metering: RL78 is analogue rich, ideal for smart metering applications. Renesas has three decades of metering experience

> Medical: RL78 offers true low power consumption and rich features, ideal for portable healthcare devices and Renesas Electronics is an active member of Continua alliance.

RL78/L12

- > RL78 CPU Core
  - 16-bit CISC, 31 DMIPS at 24 MHz
- > LCD
  - 35 seg x 8 com / 39 seg x 4 com
  - Supports capacitor split method, internal voltage
  - boost method and resistance division method
  - Supports waveform types A and B
  - Supports LCD contrast adjustment (18 steps
  - Supports LCD blinking
- > Flash Memory
  - 1.8 V Reprogramming, Boot swap support
  - Error Code Correction (ECC)
- > System
  - +/- 1% Internal Oscillator
  - 1.6 to 5.5 V operation,
    External clock (20 MHz max.)
- > Power Management
  - Operating: 63uA/MHz (minimum)
  - Stop (RAM retained): 0.23 µA, (LVD enabled):
    0.31 µA
  - Halt (RTC + LVD): 0.64 µA
  - LCD operating current (Capacitor split
    method): 0.12 µA
  - LCD operating
- > Safety
  - IEC/UL 60730 Support, Illegal memory
    access, guard
- > Timers
  - Multi-function Timer Array Unit (TAU0),
    Watchdog (window)
- > Analog
  - 1.6 V (Vcc) operation, Internal
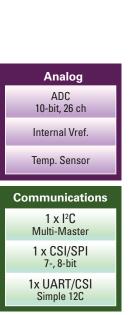   Voltage Reference (1.44 V)
- > Package
  - 32- to 64-pin

RL78 16-bit CPU
24 MHz 31 DMIPS

CISC Harvard architecture
3 stage pipeline

Four Register Banks

16-bit Barrel Shifter

Memory
| Program Flash up to 32 KB |
| SRAM up to 1.5 KB |
| Data Flash up to 2 KB |

System
| DMA 2 ch |
| Interrupt Controller 4 Levels |
| Clock Generation Internal, External |
| POR, LVD |
| MUL/DIV/MAC |
| Debug Single-Wire |

Power Management
| HALT RTC, DMA Enabled |
| SNOOZE Serial, ADC Enabled |
| STOP SRAM On |

Safety
| RAM Parity Check |
| ADC Self-diagnostic |
| Clock Monitoring |
| Memory CRC |

Timers
| Timer Array Unit 16-bit, 6 ch |
| Interval Timer 12-bit, 1 ch |
| WDT 18-bit , 1 ch |
| RTC Calendar |

Analog
| ADC 10-bit, 26 ch |
| Internal Vref. |
| Temp. Sensor |

Communications
| 1 x I²C Multi-Master |
| 1 x CSI/SPI 7-, 8-bit |
| 1x UART/CSI Simple 12C |

LCD
| 35 seg x 8 com | Charge pump | Split Cap. |

RL78/L12 Line up

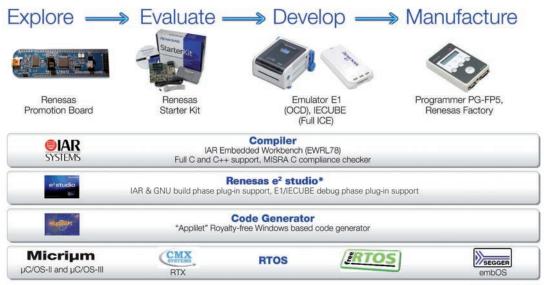| Flash Memory/ RAM (KB)		32 pins	44 pins	48 pins	52 pins	64 pins
	32 KB	1.5 K	1.5 K	1.5 K	1.5 K	1.5 K
	16 KB	1 K	1 K	1 K	1 K	1 K
	8 KB	1 K	1 K		1 K	
		10 x 10 QFP	10 x 10 QFP	7 x 7 QFP	10 x 10 QFP	10 x 10 QFP
						12 x 10 QFP
						8 x 8 QFN
		Package				

RL78 Development Tools

Extensive Renesas Development Ecosystem

Renesas Electronics and selected partners offer a comprehensive suite of hardware and software tools for the rapid evaluation and development of embedded systems built with RL78.

Explore ⟶ Evaluate ⟶ Develop ⟶ Manufacture

Renesas Promotion Board

Renesas Starter Kit

Emulator E1 (OCD), IECUBE (Full ICE)

Programmer PG-FP5, Renesas Factory

IAR SYSTEMS

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

e² studio

Renesas e² studio*
IAR & GNU build phase plug-in support, E1/IECUBE debug phase plug-in support

Applilet

Code Generator
"Applilet" Royalty-free Windows based code generator

Micriµm
µC/OS-II and µC/OS-III

CMX SYSTEMS
RTX

RTOS

free RTOS

SEGGER
embOS

*Available Q1/2012

Online technical community

RenesasRulz.com
Think it. Build it. Post it.

www.renesasrulz.com

3rd Party network

ALLIANCE PARTNER
RENESAS

www.renesas.eu/alliance

Personalised news & services

MyRenesas

www.renesas.eu/myrenesas

Online technical training

Renesas INTERACTIVE

www.renesasinteractive.com

Facebook group

f

www.facebook.com/renesaseurope

Latest news

twitter

www.twitter.com/renesas_europe

Renesas Presents video channel

YouTube

www.youtube.com/renesaspresents

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