

The first product in the RE family using SOTB™ process technology
Energy harvesting embedded controller

RE01 Group 1.5MB

Realizes intelligent and battery maintenance-free IoT device

RE01 group using **Silicon On Thin Buried Oxide (SOTB™) process technology** realizes **ultra-low current consumption in both active and standby** and **high-speed operation (64MHz) at low voltage (1.62V)**, which is not possible with conventional process technology. RE01 group is also an embedded controller, that can be operated by energy harvesting.



Innovative ultra-low power technology

Based on Renesas SOTB™ process technology
Ultra-low current consumption in both active and standby



Intelligence on the edge

64MHz high-speed operation at 1.62V low voltage
32-bit CPU Arm® Cortex®-M0+



Integrated Energy Harvesting Control Circuit

enables battery-less and maintenance free operation



Low power peripherals

Ultra-low power 14-bit ADC, Ultra-low power Flash, 2D Graphics, MIP-LCD parallel I/F

Features

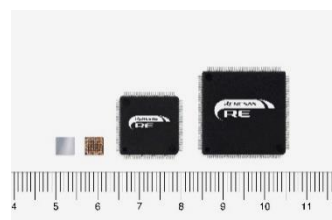
Part No. ^(*1)	7D2DBN	6D2DBN	5D2CFB	4D2CFB	1D2CFP	0D2CFP
Pin count	156		144		100	
Package	WLBGA		LQFP			
Code flash memory /SRAM	1.5Mbytes/ 256Kbytes					
CPU operating frequency	Cortex®-M0+ up to 64MHz					
DMA/DTC	4ch/ Yes					
Energy harvesting control circuit	Yes					
Timers	GPT (PWM timer)		6ch			
	AGT 16-bit timer/ TMR 8-bit timer		2ch/ 2ch			
	RTC / CCC (1second event timer)		1ch/ 1ch			
	WDT/ IWDT		1ch/ 1ch			
	MTDV (Motor driver for watches)		3ch	No		
Communications function	Stopwatch/ Buzzer		Yes/ Yes			
	SCI (UART/simple I2C/simple SPI)		7ch			
Analog	IIC/ SPI/ QSPI		2ch/ 2ch/ 1ch			
	14-bitADC		18ch		12ch	
	12-bitDAC		1ch			
HMI	Parallel MIP-LCD I/F		Yes		No	
Graphic	GDT (2D Graphics Engine)		Yes			
Data processing	Data division circuit		Yes			
Security	TSIP-Lite ^(*2)		Yes	No	Yes	No

(*1) The Part No. in the table is only the xxxxxx part of R7F0E01xxxxxx.

(*2) TSIP: Trusted Secure IP

Part No.

	156WLBGA	144LQFP	100LQFP
w/ TSIP	R7F0E017D2DBN	R7F0E015D2CFB	R7F0E011D2CFP
w/o TSIP	R7F0E016D2DBN	R7F0E014D2CFB	R7F0E010D2CFP
Size	4.47mm x 4.27mm	20mm x 20mm	14mm x 14mm
Pin pitch	0.3mm	0.5mm	0.5mm



Target Applications

The RE01 group enables energy harvesting for any IoT device, eliminating the need for battery replacement / maintenance. SOTB-powered ultra-low power 32-bit CPU realizes smart IoT devices powered by an even tiny ambient power source.

Hybrid watch

- Battery maintenance-free with energy harvesting
- Graphics on MIP-LCD,
- Power efficient sensor data processing

Smart home/ building

- Reduction of maintenance cost, Minimizing installation costs, Stylish case with battery maintenance-free

Healthcare

- 4uA ultra-low power consumption ADC
- Flash rewriting with less than 1mA
- Battery maintenance-free by energy harvesting

Smart meter

- Cost down with battery downsizing

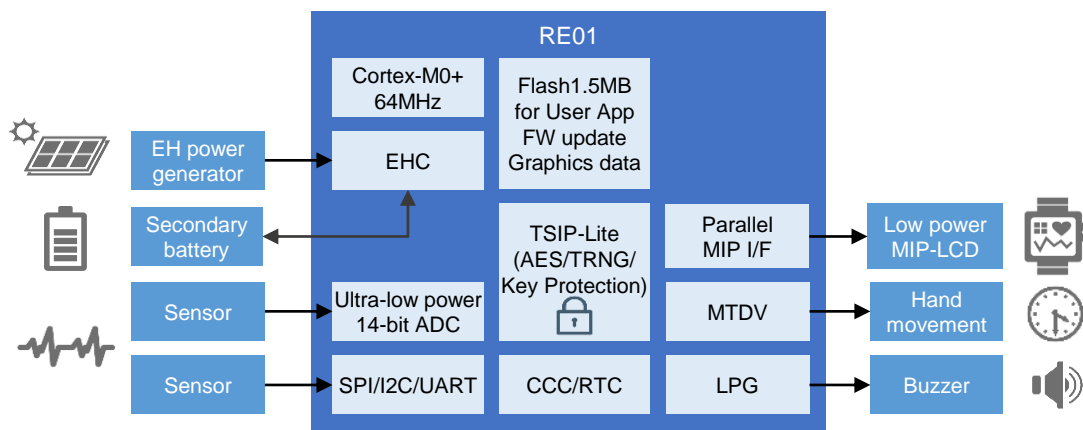
Smart agriculture

- Battery maintenance-free by energy harvesting
- Efficient yield increasing

Wearable

- Reduction of charging effort
- Long-term acquisition of data

Wearable / Hybrid watch example



Development Tools

The RE01 group is supported by a comprehensive set of software and hardware tools:

IDE

IAR EWARM
Renesas e²studio

Compiler

IAR C/C++ Compiler for ARM
GNU C/C++ Compiler

Emulator

SEGGER J-Link
IAR I-jet
Renesas E2/ E2 Lite

Driver Software

Arm® CMSIS
Renesas HAL Driver

Sample code

Low power consumption/
peripheral functions/
energy harvesting/ etc.

Evaluation kit

Evaluation Kit RE01 1500KB

Evaluation Kit RE01 1500KB



Part No: RTK70E015DS00000BE

Kit included

- Main board
- Solar panel
- MIP-LCD expansion board
- USB (micro-B)
- Startup guide

WEB download

- Software tool
- Sample code
- User's manual
- Schematics
- Gerber data