



RE01 1500KB

Implemented on Silicon on Thin Buried Oxide (SOTB) The World's Most Energy Efficient MCUs with Arm® Cortex® M Core

Innovative ultra-low power and the 1.5MB of large flash memory

The RE01 1500KB product is based on the SOTB[™] process technology which realizes ultra-low current consumption in both active and standby mode and high-speed operation (64MHz) at low voltage (1.62V), which is impossible to achieve with conventional bulk silicon processes. The RE01 1500KB product can significantly extend battery life and deliver high performance even for small batteries. In addition, its on-chip energy harvesting controller can extend the battery life further, or completely eliminate a battery to achieve a maintenance-free system. The 1.5MB of on chip flash memory can be used for applications that require the storage of large amounts of data, such as image information, and applications that require remote firmware updates (Over The Air (OTA)) via a wireless or other communications network.

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Innovative ultra-low power

Active current:35µA/MHz / 15µA/MHz(Ex DCDC) Standby current:500nA

Ultra-low power peripherals

14-bitADC:4uA, Flash programing:0.6mA,

Energy harvesting control circuit

RTC operation in Deep standby 380nA@1.8V

High-speed operation at low voltage

- High-speed operation 64MHz at low voltage 1.62V
 32-bit CPU Arm[®] Cortex[®]-M0+
- A

Strong security

- Trusted Secure IP (AES, Random number generation)
- Secure updating of flash memory, Secure boot

Features

Part No (*1)		7D2DBN	6D2DBN	5D2CEB	4D2CEB	5D2CEP	4D2CFP		
Pin count					100				
Packago		13			++ I O				
Code fleeh memory /SDAM									
Energy baryesting control circuit				401/ Vo	e				
GPT (PWM timer)					5 h				
	AGT 16-bit timer/ TMR 8-bit timer								
	RTC / CCC (1accord event timer)								
Timers									
	MIDV (Motor driver for watches)	j 3cn j No							
	Stopwatch/ Buzzer	Yes/Yes							
Communications SPI)		7ch							
Tunction	IIC/ SPI/ QSPI	QSPI 2ch/ 2ch/ 1ch							
Analog	14-bitADC		180	12ch					
Analog	12-bitDAC	1ch							
HMI	Parallel MIP-LCD I/F	Yes							
Graphic	GDT (2D Graphics Engine)	Yes							
Data processing	Data division circuit	Yes							
Security	TSIP-Lite(*2)	Yes	No	Yes	No	Yes	No		
(*1) The Part No. in the table is only the xxxxxx part of R7F0E01xxxxx			E01xxxxxx.						

(*2) TSIP: Trusted Secure IP

Reduction of active current by External DCDC mode

Current consumption can be reduced to 15µA/MHz by using Renesas' ultra-low lq ISL9123 as an external stepdown regulator. External DCDC mode can be used for applications such as Always On sensing. **Application Note**: How to reduce power consumption by using an external DC/DC converter (<u>R01AN5364</u>)



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	156WLBGA	144LQFP	100LQFP
w/ TSIP	R7F0E017D2DBN	R7F0E015D2CFB	R7F0E015D2CFP
w/o TSIP	R7F0E016D2DBN	R7F0E014D2CFB	R7F0E014D2CFP
Size	4.47mm x 4.27mm	20mm x 20mm	14mm x14mm
Pin pitch	0.3mm	0.5mm	0.5mm



Target Applications

Hybrid watch

- Solar power drive
- High-speed CPU : acceleration / heart rate
- Low power graphic, MIP-LCD display

Smart meter

- OTA (Over the air)with large memory

Smart home / building

- Improved design with smaller battery
- Reduce the battery maintenance cost by -
- longer battery life and energy harvesting

Smart agriculture

- Easy installation and cost reduction of battery maintenance by energy harvesting.

Healthcare

- High-speed processing with coin battery

- Ultra low power ADC 4uA for analog sense
- Ultra low power OTA 600uA

Tracker

- Preventing missing tracking by

maintenance free

- Low power RTC



Development	loois	-				Ì

IDE	Compiler	Emulator				
IAR EWARMIAR C/C++ Compiler for ARMRenesas e²studioGNU C/C++ Compiler		SEGGER J-Link IAR I-jet Renesas E2/ E2 Lite				
Driver Software	Sample Code	Evaluation kit				
Arm® CMSIS	Driver SW sample code	EK-RE01 256KB				

Evaluation kit: EK-RE01 1500KB



Part No: RTK70E015DS00000BE

EK-RE01 1500KB supports MCU current measurement, energy harvesting evaluation and sensor connectivity expansion through PMOD or/and Arduino interfaces.

Kit included

- Main board
- Solar panel
- MIP-LCD expansion board
 - USB cable(type-A male to micro-B male)
- WEB download
- Software tool
- Sample code
- User's manual
- . Schematics
- Gerber data

For more info on the RE01 Family, please go to our website at www.renesas.com/re.



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