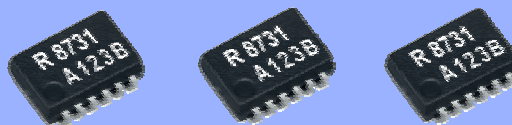


**Built-in EEPROM and Unique ID-ROM
I²C-Bus INTERFACE REAL TIME CLOCK MODULE**

RX - 8731 LC

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : I²C-Bus interface (400 kHz)
- Operating voltage range : 1.7 V to 5.5 V
- Wide Timekeeper voltage range : 1.3 V to 5.5 V
- Low backup current : 0.35 μA / 3 V (Typ.)
- 32.768 kHz frequency output function : C-MOS output With Control Pin
- The various functions include full calendar, alarm, timer.

* The I²C-Bus is a trademark of Philips Electronics N.V.

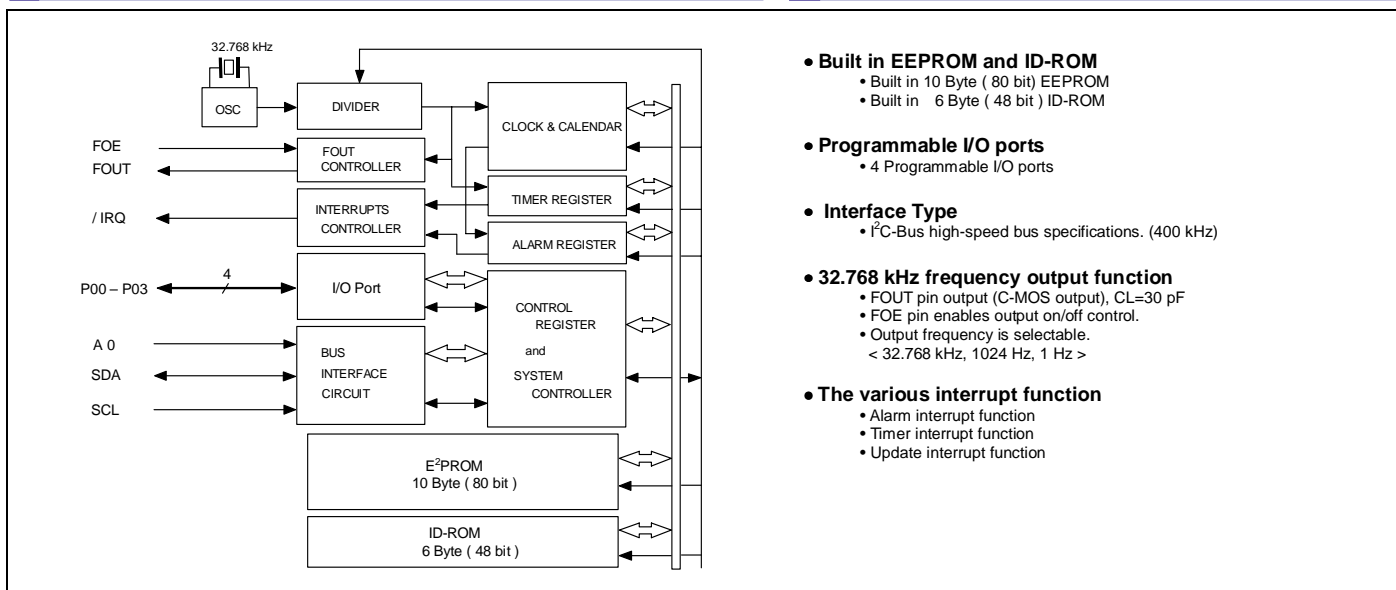


Actual size



Block diagram

Overview

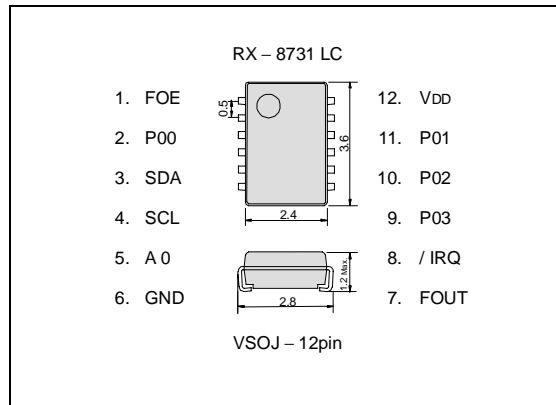


- **Built in EEPROM and ID-ROM**
 - Built in 10 Byte (80 bit) EEPROM
 - Built in 6 Byte (48 bit) ID-ROM
- **Programmable I/O ports**
 - 4 Programmable I/O ports
- **Interface Type**
 - I²C-Bus high-speed bus specifications. (400 kHz)
- **32.768 kHz frequency output function**
 - FOUT pin output (C-MOS output), CL=30 pF
 - FOE pin enables output on/off control.
 - Output frequency is selectable.
< 32.768 kHz, 1024 Hz, 1 Hz >
- **The various interrupt function**
 - Alarm interrupt function
 - Timer interrupt function
 - Update interrupt function

Pin Function

Terminal connection / External dimensions (Unit:mm)

Signal Name	Input / Output	Function
SCL	Input	Serial Clock input pin.
SDA	Bi-directional	Data input and output pin.
A 0	Input	Device address A0 input pin.
FOUT	Output	FOUT pin is 32.768 kHz clock output pin (C-MOS) that output control is possible.
FOE	Input	FOE pin control the frequency output from FOUT pin with FSEL1-bit and FSEL0-bit etc.
/IRQ	Output	Interrupt output pin. (N-ch open drain)
P00 P01 P02 P03	Bi-directional	Programmable I/O ports.
V _{DD}	—	Connected to a positive power supply.
GND	—	Connected to a ground.



Specifications (characteristics)

* Refer to application manual for details.

Recommended Operating Conditions

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power voltage	V _{DD}	—	1.7	3.0	5.5	V
Clock voltage	V _{CLK}	—	1.3	3.0	5.5	V
Operating temperature	T _{OPR}	—	-40	+25	+85	°C

Frequency characteristics

Item	Symbol	Condition	Rating	Unit
Frequency tolerance	Δ f / f	T _a = +25 °C V _{DD} = 3.0 V	5 ± 23 *	× 10 ⁻⁶
Oscillation Start-up time	t _{STA}	T _a = +25 °C V _{DD} = 1.6 V	1 Max.	s
		T _a = -40 °C to +85 °C V _{DD} = 1.6 V	3 Max.	s

*Equivalent to 1 minute of monthly deviation

DC characteristics

T_a = -40 °C to +70 °C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Current Consumption	I _{BK}	f _{SCL} = 0 Hz / IRQ = OFF FOUT : output OFF (Hi - z)	V _{DD} = 5 V	0.45	0.9	μA
			V _{DD} = 3 V	0.35	0.7	
Current Consumption	I _{32k}	f _{SCL} = 0 Hz / IRQ = OFF FOUT : 32.768 kHz output CL = 30 pF	V _{DD} = 5 V	8.0	16.0	μA
			V _{DD} = 3 V	5.0	10.0	

“3D STRATEGY” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, “Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, all environmental initiatives operate under the Plan-Do-Check-Action(PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard. All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification. In the future, new group companies will be expected to acquire the certification around the third year of operations.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

WORKING FOR HIGH QUALITY

Epson Toyocom quickly began working to acquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification for all targeted products manufactured in Japanese and overseas plants.

Epson Toyocom has acquired QS-9000 certification, which is of a higher level. Also, TS 16949 certification, which is also of a higher level, has been acquired.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from the automobile industry.

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 - / Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
 - / traffic control equipment / and others requiring equivalent reliability.
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