High-Stability Frequency with Built in Timestamp and Power Switching I²C-Bus REAL TIME CLOCK MODULE

NEW

RX-8035 SA / LC

- Built-in 32.768 kHz crystal unit : Frequency adjusted for high accuracy. (± 5 ×10⁻⁶ / Ta = +25 °C)
- Interface Type : I²C-Bus Interface (400kHz)
- Operating voltage range : 2.4 V to 5.5 V
- Timekeeping voltage range : 1.0 V to 5.5 V
- Low backup current : 350 nA (SA) 400 nA (LC) / 3 V (Typ.)
- Event detection and Time stamp : One-shot full timestamp and interrupt.
- Dual event detection ports : Each terminal has a de-bounce circuit.
- Auto power switching functions : When VDD deteriorates than 2.4V, internal source is switched to VBAT.

The I²C-Bus is a trademark of NXP Semiconductors

RoHS Compliant

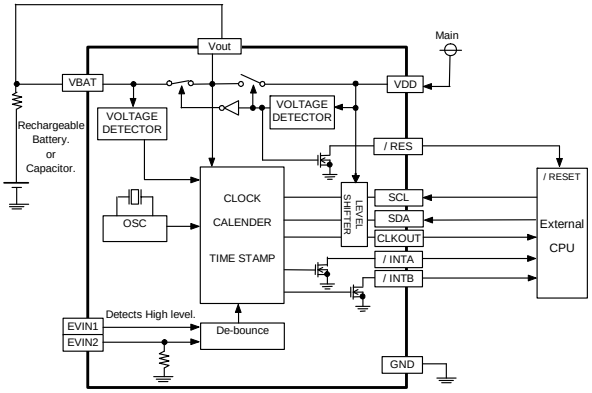
Product Number (Please contact us)
RX-8035SA: X1B000172xxxx00
RX-8035LC: X1B000182xxxx00

Actual size

RX-8035SA

RX-8035LC

Block diagram



Overview

- **The event detection and Timestamp function**
  Dual event detection terminals.
  Selectable de-bounce period 35ms or 2s.
  Available event detection interrupt output.

- **Power switching functions.**
  - When VDD is less than 2.4V, an internal source is switched to VBAT, and /RES is Low level. When VDD voltage rises to higher than 2.52V, an internal source is switched to VDD, and /RES is released with 105ms delay.
  - Note: When the supply from VBAT, SCL and SDA are disabled.

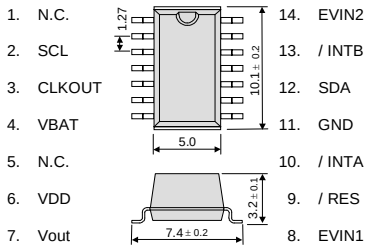
- **Alarm, Periodic interrupt, 32.768kHz clock output.**
  - Available monthly-alarm and weekly-alarm.
  - Interrupt period are selectable from 2Hz to Monthly.
  - CLKOUT outputs 32.768kHz clock powered by VDD.

Pin function

Signal Name	Input / Output	Function
SCL	Input	I2C serial clock.
SDA	In/Out	I2C data in/out.
VDD	—	Main power supply.
VBAT	—	Power supply for backup.
Vout	Output	Switched power out. (maximum output current 20mA)
/ RES	Output	VDD voltage state.
GND	—	Ground
EVIN1	Input	Event detection input 1
EVIN2	Input	Event detection input 2
/ INTA	Output	Interrupt out A.
/ INTB	Output	Interrupt out B.
CLKOUT	Output	32.768kHz output. (CMOS. Can not inhibit.)
N.C.	—	Do not connect.

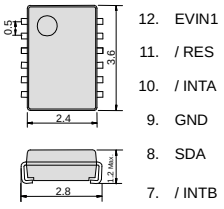
Terminal connection / External dimensions (Unit:mm)

RX – 8035 SA



SOP – 14 pin

RX – 8035 LC



VSOJ – 12pin

The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

***Stop using the glue**
Any glue must never use it after soldering LC-package to a circuit board.This product has glass on the back side of a package.When glue invasions between circuit board side and glass side, then glass cracks by thermal expansion of glue.In this case a crystal oscillation stops.Consider glue abolition or glue do not touch to LC-package

Specifications (characteristics)

* Refer to application manual for details.

Recommended Operating Conditions

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating voltage	VACCESS	VDD	2.4	3.0	5.5	V
Time keeping voltage	VCLK	VBAT	1.0	3.0	5.5	V
Operating temperature	TOPR	—	-40	+25	+85	°C
Storage temperature	TSTG	—	-55	—	+125	°C

Frequency characteristics

Item	Symbol	Conditions	Rating	Unit
Frequency tolerance	Δ f / f	Ta = +25°C VBAT = 3.0 V	B: 5 ± 23 *1) AA: 5 ± 5 *2) AC: 0 ± 5 *2)	× 10⁻⁶
Oscillation start-up time	tSTA	Ta = +25 °C VDD = 3.0 V	1 Max.	s
Frequency / voltage characteristics	f / V	Ta = +25 °C VDD = 2.4 V to 5.5 V	± 1 Max.	× 10⁻⁶

*1) Equivalent to 1 minute of monthly deviation (excluding offset.)
*2) Equivalent to 13 seconds of monthly deviation (excluding offset.)

Current consumption characteristics

Ta = –40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current Consumption	IBAT	RX-8035SA VBAT = 3.0V, VDD = 0.0V SCL=SDA = GND	-	350	1200	nA
		RX-8035LC VBAT = 3.0V, VDD = 0.0V SCL=SDA = GND		400		
	IDD	VDD = 3.0V SCL=SDA = GND CLKOUT = open	-	1.40	2.50	µA

Power supply detection voltage

Ta = –40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
VBAT detect voltage	VLOW	-	1.10	1.25	1.40	V
Power switching voltage (VDD to VBAT)	VD2B	+25 °C	2.328	2.40	2.472	V

PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, 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.

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

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

►Explanation of the mark that are using it for the catalog

Pb Free	►Pb free.
RoHS Compliant	►Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)
For Automotive	►The products have been designed for high reliability applications such as Automotive.

Notice

- This material is subject to change without notice.
- Any part of this material may not be reproduced or duplicated in any form or any means without the written permission of Seiko Epson.
- The information about applied circuitry, software, usage, etc. written in this material is intended for reference only. Seiko Epson does not assume any liability for the occurrence of infringing on any patent or copyright of a third party. This material does not authorize the licensing for any patent or intellectual copyrights.
- When exporting the products or technology described in this material, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
- You are requested not to use the products (and any technical information furnished, if any) for the development and/or manufacture of weapon of mass destruction or for other military purposes. You are also requested that you would not make the products available to any third party who may use the products for such prohibited purposes.
- These products are intended for general use in electronic equipment. When using them in specific applications that require extremely high reliability, such as the applications stated below, you must obtain permission from Seiko Epson in advance.
  / Space equipment (artificial satellites, rockets, etc.) / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.) / 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.
- All brands or product names mentioned herein are trademarks and/or registered trademarks of their respective.