

# REAL TIME CLOCK MODULE (I<sup>2</sup>C-Bus)

## High-Stability Frequency with Built in Timestamp and Power Switching

### RX-8035SA / LC



Product Number  
**RX-8035SA B : X1B000172000100**  
**RX-8035SA AC : X1B000172000200**  
**RX-8035SA AA : X1B000172000300**  
**RX-8035LC B : X1B000182000100**  
**RX-8035LC AC : X1B000182000200**  
**RX-8035LC AA : X1B000182000300**

- Built-in 32.768 kHz crystal unit : Frequency adjusted for high accuracy.  
 $(\pm 5 \times 10^{-6} / T_a = +25^\circ\text{C})$
- Interface Type : I<sup>2</sup>C-Bus Interface (400kHz)
- Operating voltage range : 2.4 V to 5.5 V
- Wide voltage for Timekeeping. : 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 : It switches VDD and VBAT, automatically.
- Dual Alarm, Periodic interruption.

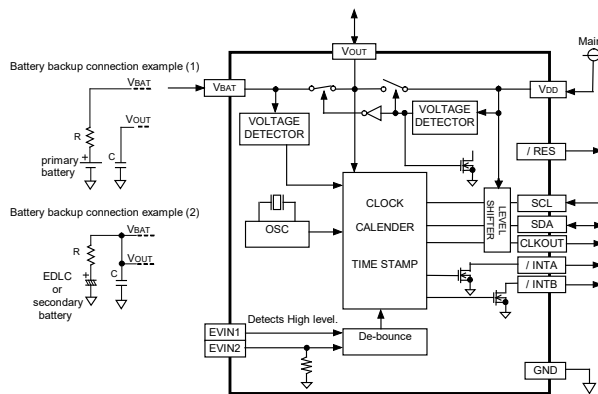


RX-8035SA



RX-8035LC

## Block diagram



## Overview

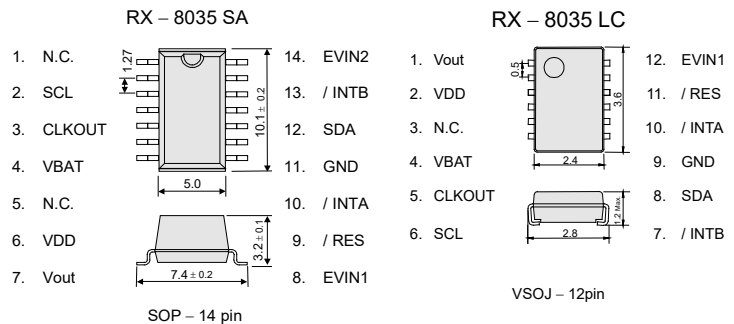
- **The event detection and Timestamp function**  
 Dual event detection terminals.  
 Selectable de-bounce time 35ms or 2s.  
 Available event detection interrupt output.
- **Power switching functions.**
  - An external diode is unnecessary to have a reverse current prevention switch built-in in the VBAT side to connect a primary cell to.
  - 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- Dual alarm.
  - Interrupt period are selectable from 2Hz to Monthly.
  - CLKOUT outputs 32.768kHz, it powered from VDD.

## Pin function

Signal Name	Input / Output	Function
SCL	Input	I <sup>2</sup> C serial clock.
SDA	In/Out	I <sup>2</sup> C 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)



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.

**Prohibition of use of glue after a mount of a product**  
 An LC package product cannot use glue and resin coating.  
 When such a processing is necessary, please examine a CE package product.

## 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	$\Delta f / f$	Ta = +25°C VBAT = 3.0 V	B: $5 \pm 23^{*1}$ AA: $5 \pm 5^{*2}$ AC: $0 \pm 5^{*2}$	$\times 10^{-6}$
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	$\pm 1$ Max.	$\times 10^{-6}$

\*1) Equivalent to  $\pm 1$  minute of monthly deviation (excluding offset).  
 \*2) Equivalent to  $\pm 13$  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
	IBAT	RX-8035LC VBAT = 3.0V, VDD = 0.0V SCL=SDA = GND	-	400	1200	nA
	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
Voltage of low battery 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

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	► Pb free.
	► 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.)
	► Designed for automotive general equipment.
	► Designed for automotive applications related to driving and safety.

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