



# REAL TIME CLOCK MODULE (I<sup>2</sup>C-Bus) Built-in 32.768 kHz-DTCXO, High Stability

## RX-8803SA / LC

- Product Number**  
 RX-8803SA UB : X1B000151000100  
 RX-8803SA UA : X1B000151000200  
 RX-8803SA UC : X1B000151000300  
 RX-8803SA AA : X1B000151000400  
 RX-8803LC UA : X1B000142000100  
 RX-8803LC UB : X1B000142000200  
 RX-8803LC UC : X1B000142000300  
 RX-8803LC AA : X1B000142000400

- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO.
- 1/100s resolution Time register
- Interface Type : I<sup>2</sup>C-Bus interface (400kHz)
- Interface voltage range : 1.6 V to 5.5 V
- Temp. compensated voltage range : 2.2 V to 5.5 V
- Clock supply voltage range : 1.6 V to 5.5 V
- Selectable clock output (32.768 kHz, 1024 Hz, 1 Hz)
- The various functions include full calendar, alarm, timer, EVIN input.

Epson prepared Linux driver for development.

([http://www5.epsondevice.com/en/information/support/linux\\_rtc/](http://www5.epsondevice.com/en/information/support/linux_rtc/))

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The I<sup>2</sup>C-Bus is a trademark of NXP Semiconductors.

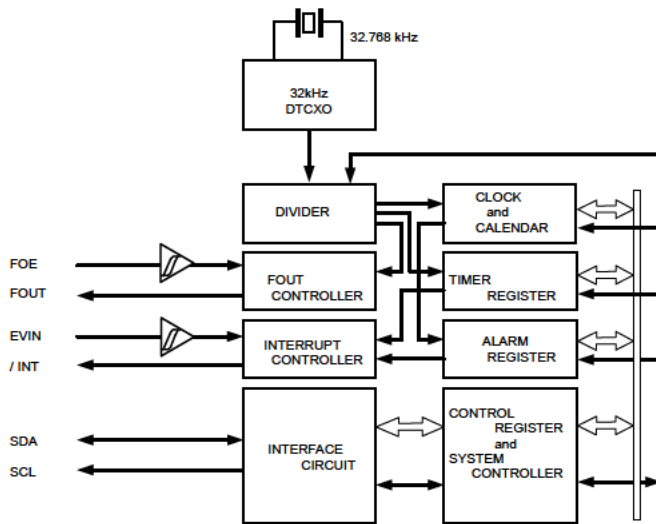


RX-8803SA



RX-8803LC

### Block diagram



### Overview

- **High Stability**
  - UA ± 3.4 × 10<sup>-6</sup> / -40 °C to +85 °C (Equivalent to ±9 seconds of month deviation)
  - UB ± 5.0 × 10<sup>-6</sup> / -40 °C to +85 °C (Equivalent to ±13 seconds of month deviation)
  - UC ± 5.0 × 10<sup>-6</sup> / -30 °C to +70 °C
  - AA (+5 ± 5.0) × 10<sup>-6</sup> / +25 °C
- **High Resolution:** 1/100s Time register with capture buffer
- **32.768 kHz frequency output function**
  - FOUT pin output (C-MOS output), CL=30 pF
  - Output selectable: 32.768 kHz, 1024 Hz, 1 Hz
- **The various interrupt**
  - Timer Function can be set between 1/ 4096 second and 4095 minutes.
  - Alarm Function can be set to day of week, day, hour, or minute.
  - EVIN input.
- **Time synchronize function with 1PPS signal input**
- **Register compatibility:** upper compatible with RX-8801.

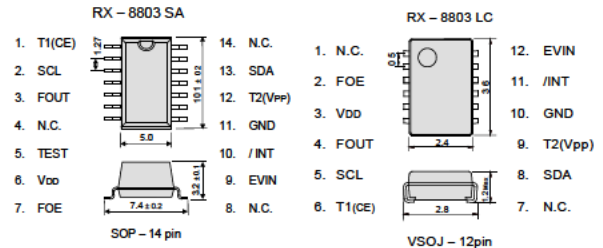
\*It is possible to use it by the terminal connection as 32.768 kHz-DTCXO.

### Pin Function

| Signal Name | I / O  | Function                                                                          |
|-------------|--------|-----------------------------------------------------------------------------------|
| T1(CE)      | input  | Use by the manufacture for testing. ( Do not connect externally.)                 |
| SCL         | input  | Serial clock input pin.                                                           |
| FOUT        | Output | The pin outputs the reference clock signal. ( CMOS output )                       |
| TEST        | input  | Use by the manufacture for testing. ( Do not connect externally. RX-8803SA only.) |
| VDD         | -      | Connected to a positive power supply                                              |
| FOE         | input  | The input pin for the FOUT output control.                                        |
| EVIN        | input  | External event input.                                                             |
| /INT        | Output | Interrupt output (N-ch. open drain).                                              |
| GND         | -      | Connected to a ground                                                             |
| T2(VPP)     | -      | Use by the manufacture for testing. ( Do not connect externally.)                 |
| SDA         | I/O    | Data input and output pin.                                                        |

### 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.

**\*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.

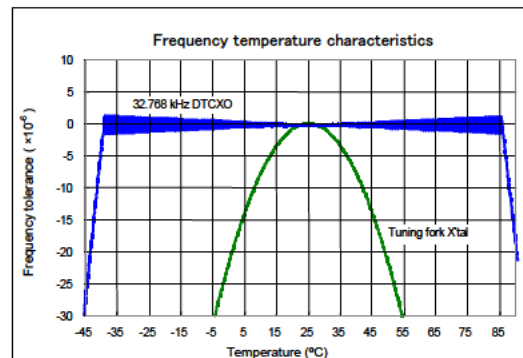
### Specifications (characteristics)

\* Refer to application manual for details.

#### Electrical Characteristics

| Item                      | Symbol           | Conditions                                                   | Min.                  | Typ.                  | Max. | Unit               |    |
|---------------------------|------------------|--------------------------------------------------------------|-----------------------|-----------------------|------|--------------------|----|
| Operating voltage         | VDD              | Interface voltage                                            | 1.6                   | 3.0                   | 5.5  | V                  |    |
| Temp. compensated Voltage | VTEM             | Temp. compensated voltage                                    | 2.2                   | 3.0                   | 5.5  | V                  |    |
| Clock supply voltage      | VCLK             | -                                                            | 1.6                   | 3.0                   | 5.5  | V                  |    |
| Operating temperature     | TOPR             | -                                                            | -40                   | +25                   | +85  | °C                 |    |
| Stability                 | Δf/f             | UA                                                           | Ta = -40 °C to +85 °C | ±3.4 <sup>*1</sup>    |      | × 10 <sup>-6</sup> |    |
|                           |                  | UB                                                           | Ta = -40 °C to +85 °C | ±5.0 <sup>*2</sup>    |      |                    |    |
|                           |                  | UC                                                           | Ta = -30 °C to +70 °C |                       |      |                    |    |
|                           |                  | AA                                                           | Ta = +25 °C           | 5 ± 5.0 <sup>*3</sup> |      |                    |    |
| Current consumption (1)   | I <sub>DD1</sub> | Backup Mode<br>FOE = GND,<br>/INT = VDD<br>FOUT output : OFF | VDD = 5V              | -                     | 0.75 | 3.4                | μA |
| Current consumption (2)   | I <sub>DD2</sub> |                                                              | VDD = 3V              | -                     | 0.75 | 2.1                | μA |

#### 32.768 kHz-DTCXO Frequency temperature characteristics (Example)



\*1) Equivalent to ±9 seconds of month deviation. \*2) Equivalent to ±13 seconds of month deviation.

\*3) Equivalent to ±13 seconds of month deviation. ( excluding offset )