

REAL TIME CLOCK MODULE (I²C-Bus)
Built-in 32.768 kHz-DTCXO, High Stability
and Power Switching

RX 8900 SA / CE

- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO.
- Interface Type : I²C-Bus interface (400kHz)
- Interface voltage range : 2.5 V to 5.5 V
- Temp. compensated voltage range : 2.0 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, temp. sensor function.
- Epson prepared Linux driver for development.
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- The registered trademark Linux® is used pursuant to a sublicense from LMI (Linux Mark Institute)
- The I²C-Bus is a trademark of NXP Semiconductors.



Product Number (Please contact us)
 RX8900SA : X1B000292xxx00
 RX8900CE UA : X1B000301000100
 RX8900CE UB : X1B000301000200
 RX8900CE UC : X1B000301000300

CE



RX8900SA
(10.1 × 7.4 × 3.3 mm)



RX8900CE
(3.2 × 2.5 × 1.0 mm)

Actual size

RX8900SA



RX8900CE



Block diagram



Overview

- **High Stability**
 - UA ± 3.4 × 10⁻⁶ / -40 °C to +85 °C (Equivalent to ±9 seconds of month deviation)
 - UB ± 5.0 × 10⁻⁶ / -40 °C to +85 °C (Equivalent to ±13 seconds of month deviation)
 - UC ± 5.0 × 10⁻⁶ / -30 °C to +70 °C (Equivalent to ±13 seconds of month deviation)
- **32.768 kHz frequency output function**
 - FOUT pin output (C-MOS output), CL=30 pF
 - Output selectable: 32.768 kHz, 1024 Hz, 1 Hz
- **Available automatic battery backup switch-over function**
 - Charge from VDD to backup battery connected to VBAT is possible. VDD voltage drop (VDET3) detection and automatically switches to the backup battery.
 - This circuit is optimal to backup with a secondary battery and a large capacitor.
- **Timer function**
 - Timer period is adjustable in 1/4096 second from 4095 minutes.
- **Alarm function**
 - Available dual-alarm, weekly and monthly.
- **Temp. sensor function**
 - Available readout temperature data from embedded temp sensor. (Bank_2_Add17h)

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) |
| VBAT | - | Battery supply. This pin has charge capability to backup battery. |
| VDD | - | Connected to a positive power supply |
| FOE | input | The input pin for the FOUT output control. |
| /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.

Specifications (characteristics)

* Refer to application manual for details.

■ Electrical Characteristics

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------------|------------------|---|-----------------------|------|--------------------|--------------------|----|
| Operating voltage | V _{DD} | Interface voltage | 2.5 | 3.0 | 5.5 | V | |
| Temp. compensated Voltage | V _{TEM} | Temp. compensated voltage | 2.0 | 3.0 | 5.5 | V | |
| Clock supply voltage | V _{CLK} | Internal clock | 1.6 | 3.0 | 5.5 | V | |
| Operating temperature | T _{OPR} | No condensation | -40 | +25 | +85 ^{*1} | °C | |
| Stability | Δf/f | UA | Ta = -40 °C to +85 °C | | ±3.4 ^{*2} | × 10 ⁻⁶ | |
| | | UB | Ta = -40 °C to +85 °C | | ±5.0 ^{*3} | | |
| | | UC | Ta = -30 °C to +70 °C | | | | |
| Current consumption (1) | I _{DD1} | fSCL=0Hz, /INT=V _{DD} , FOE=GND, V _{DD} =V _{BAT} , FOUT: OFF | V _{DD} = 5V | - | 0.72 | 1.5 | μA |
| Current consumption (2) | I _{DD2} | Temp. Compensation interval 2.0 s. | V _{DD} = 3V | - | 0.70 | 1.4 | μA |

*1) Please contact us about +85 °C < T_{OPR}

*2) Equivalent to ±9 seconds of month deviation. *3) Equivalent to ±13 seconds of month deviation.

■ 32.768 kHz-DTCXO Frequency temperature characteristics (Example)



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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 applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc. |
|  | ► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc). |

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