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.
(http://www5.epsondevice.com/en/information/support/linux_rtc/)

Pb Free
RoHS Compliant
CE

Product Number (Please contact us)
RX8900SA : X1B000292xxxx00
RX8900CE UA : X1B000301000100
RX8900CE UB : X1B000301000200
RX8900CE UC : X1B000301000300

RX8900SA
(10.1 × 7.4 × 3.3 mm)

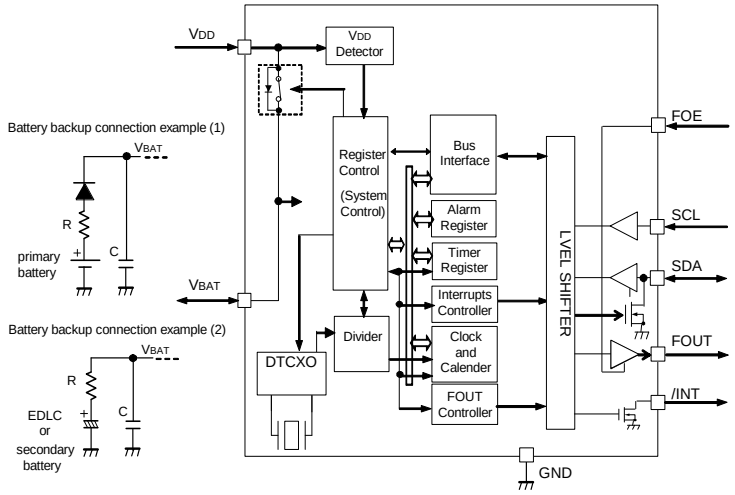
RX8900CE
(3.2 × 2.5 × 1.0 mm)

Actual size

RX8900SA

RX8900CE

Block diagram



Overview

- **High Stability**
  - UA ± 3.4 x 10^{-6} / -40 ºC to +85 ºC
    (Equivalent to ±9 seconds of month deviation)
  - UB ± 5.0 x 10^{-6} / -40 ºC to +85 ºC
    (Equivalent to ±13 seconds of month deviation)
  - UC ± 5.0 x 10^{-6} / -30 ºC to +70 ºC
    (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

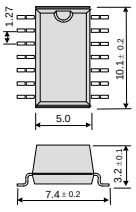
Signal Name	I / O	Function
T1(CE)	input	Use by the manufacture for testing. (Do not connect externally.)
SCL	input	Serial clock input pin.
FOUT	Output	The pin outputs the reference clock signal. (CMOS output)
VBAT	-	Battery supply. This pin has charge capability to backup battery.
VDD	-	Connected to 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)

RX8900SA

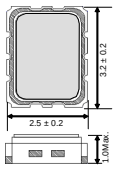
1.	T1(CE)	14.	N.C.
2.	SCL	13.	SDA
3.	FOUT	12.	T2(VPP)
4.	N.C.	11.	GND
5.	VBAT	10.	/ INT
6.	VDD	9.	N.C.
7.	FOE	8.	N.C.



SOP – 14 pin

RX8900CE

1.	FOE	10.	/INT
2.	VDD	9.	GND
3.	VBAT	8.	T2(VPP)
4.	FOUT	7.	SDA
5.	SCL	6.	T1(CE)



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.

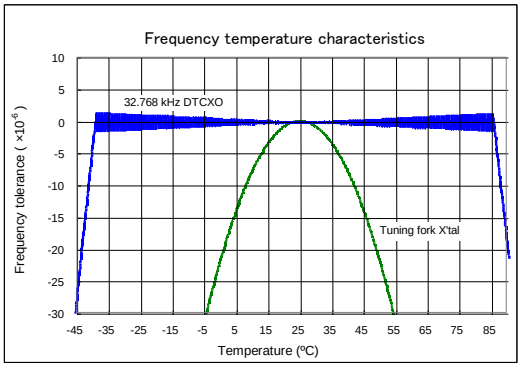
■ Electrical Characteristics

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
Operating voltage	VDD	Interface voltage		2.5	3.0	5.5	V
Temp. compensated Voltage	VTEM	Temp. compensated voltage		2.0	3.0	5.5	V
Clock supply voltage	VCLK	Internal clock		1.6	3.0	5.5	V
Operating temperature	TOPR	No condensation		-40	+25	+85*1	ºC
Stability	Δ f / f	UA	Ta = -40 ºC to +85 ºC	±3.4 *2			× 10^{-6}
		UB	Ta = -40 ºC to +85 ºC	±5.0 *3			
		UC	Ta = -30 ºC to +70 ºC				
Current consumption (1)	IDD1	fSCL=0Hz, /INT=VDD, FOE =GND VDD=VBAT	VDD = 5V	-	0.72	1.5	µA
Current consumption (2)	IDD2	FOUT: OFF Temp. Compensation interval 2.0 s.	VDD = 3V	-	0.70	1.4	

*1) Please contact us about +85 °C < TOPR

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

■ 32.768 kHz-DTCXO Frequency temperature characteristics (Example)



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

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