

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

Built-in 32.768 kHz DTCXO, High Stability,  
Power switching



Product Number  
 1,000 pcs / Reel  
**RX8900SA UA: X1B000292000100**  
**RX8900SA UB: X1B000292000200**  
**RX8900SA UC: X1B000292000300**  
 2,000 pcs / Reel  
**RX8900CE UA: X1B000301000100**  
**RX8900CE UB: X1B000301000200**  
**RX8900CE UC: X1B000301000300**

## RX8900SA / RX8900CE

- Built-in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type : I<sup>2</sup>C-Bus
- Interface voltage range : 2.5 V to 5.5 V
- Temp. compensated voltage range : 2.0 V to 5.5 V
- Timekeeping voltage range : 1.6 V to 5.5 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the VDD voltage
- Interrupt output : Wake up every minute or every second
- Alarm interruption : Day, date, hour, minute
- Auto repeat wakeup timer interruption



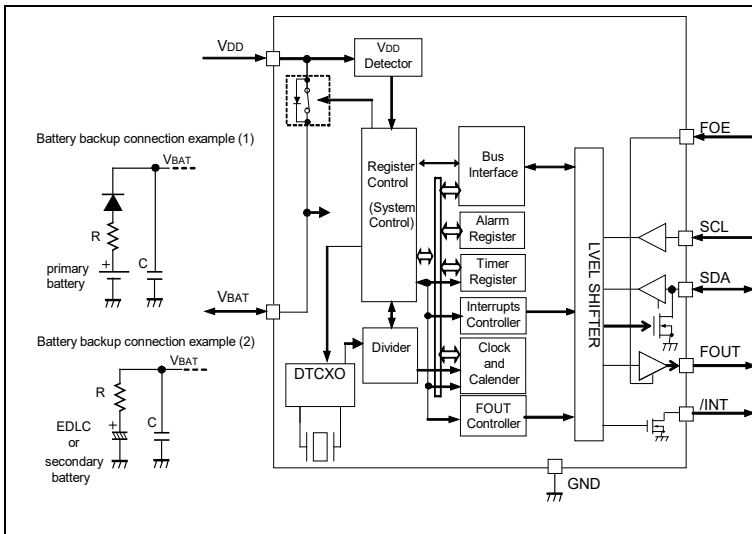
RX8900SA



RX8900CE

( 10.1 x 7.4 mm, t = 3.3 mm Max. ) ( 3.2 x 2.5 mm, t = 1.0 mm Max. )

### Block diagram



### Overview

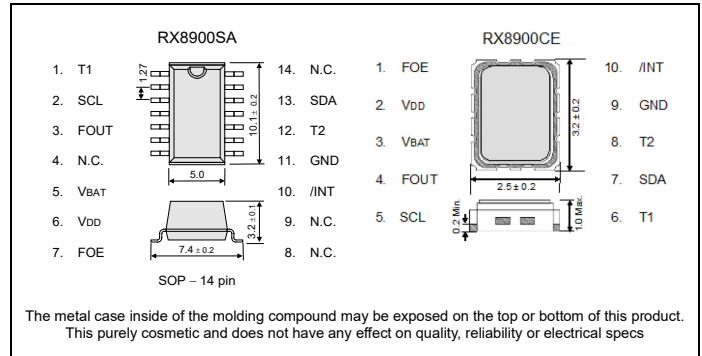
- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- High stability  
UA:  $\pm 3.4 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 9$  s of mo. deviation)  
UB:  $\pm 5.0 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 13$  s of mo. deviation)  
UC:  $\pm 5.0 \times 10^{-6}$  / -30 °C to +70 °C (equiv. to  $\pm 13$  s of mo. deviation)
- Auto power switch function  
The VDD voltage is monitored and it switches to the backup power supply by the automatic operation  
Backup power supply switching voltage 1.9 V Min.
- Clock output function  
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
- Wakeup timer function  
Selectable from 244  $\mu$ s to 2.8 days (12 bit x 1 ch.)  
Timer source clock selectable from 1/60 Hz, 1 Hz, 64 Hz, 4096 Hz  
Auto release after interrupt output from /INT pin at timer completes  
This operation is auto repeat with a selected cycle, it can be used like a watchdog timer
- Alarm function  
It is possible program from day to minute
- Temp. sensor function  
Available readout temperature data from embedded temp sensor

### Pin Function

Signal Name	I / O	Function
T1	-	Test pin in the factory (Do not connect externally)
SCL	Input	Serial clock input pin
FOUT	Output	Frequency output pin (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz)
VBAT	-	This is a power supply pin for backup battery Connect an EDLC, a secondary battery, a primary battery. In the backup voltage range, supplied to IC, from this pin
VDD	-	Power-supply pin
FOE	Input	The FOUT output control pin
/INT	Output	Interrupt output (N-ch. open drain).
GND	-	Ground pin
T2	-	Test pin in the factory (Do not connect externally)
SDA	Input / Output	Serial data input and output pin

### Terminal connection / External dimensions

(Unit: mm)

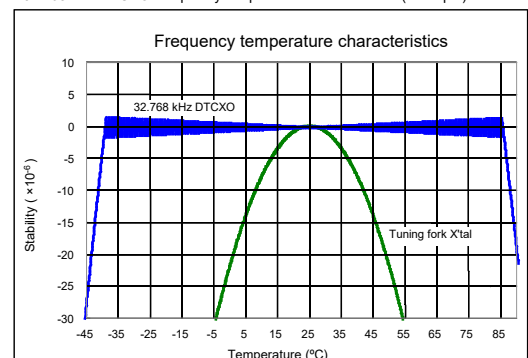


### Specifications (characteristics)

\* Refer to application manual for details

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Operating voltage	VDD	-	2.5	3.0	5.5	V	
Temp. compensated Voltage	VTEM	-	2.0	3.0	5.5	V	
Clock supply voltage	VCLK	-	1.6	3.0	5.5	V	
VDD detect voltage (3)	VDET3	-	2.3	2.4	2.5	V	
Operating temperature	Ta	-	-40	+25	+85	°C	
Stability	$\Delta f / f$	UA	Ta = -40 °C to +85 °C		$\pm 3.4$	$\times 10^{-6}$	
		UB	Ta = -40 °C to +85 °C		$\pm 5.0$		
		UC	Ta = -30 °C to +70 °C				
Current consumption (1)	I <sub>DD1</sub>	fSCL = 0 Hz, /INT = VDD, FOE = GND, VDD = VBAT, FOUT: OFF, Temp. Compensation interval 2.0 s	VDD = 5 V	-	0.72	1.5	$\mu$ A
Current consumption (2)	I <sub>DD2</sub>		VDD = 3 V	-	0.70	1.4	$\mu$ A

### 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.

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IATF 16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

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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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