

# 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 V<sub>DD</sub> voltage
- Interrupt output : Wake up every minute or every second
- Alarm interruption : Day, date, hour, minute
- Auto repeat wakeup timer interruption



RX8900SA



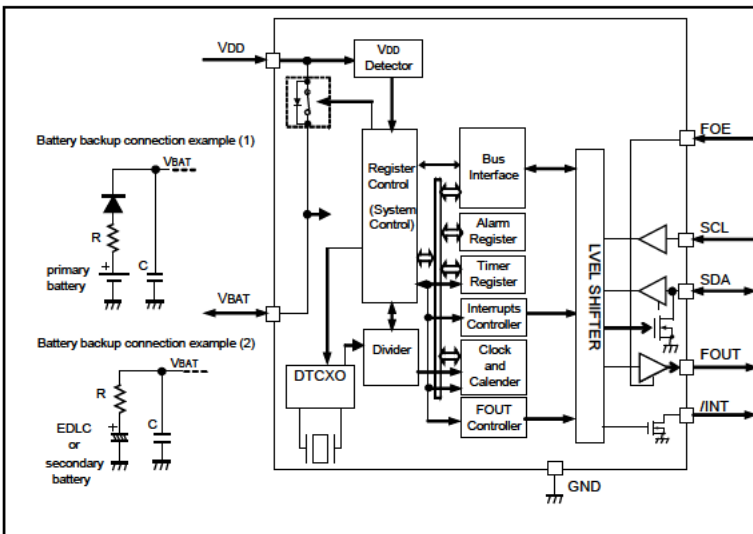
RX8900CE

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

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

### Block diagram

### Overview



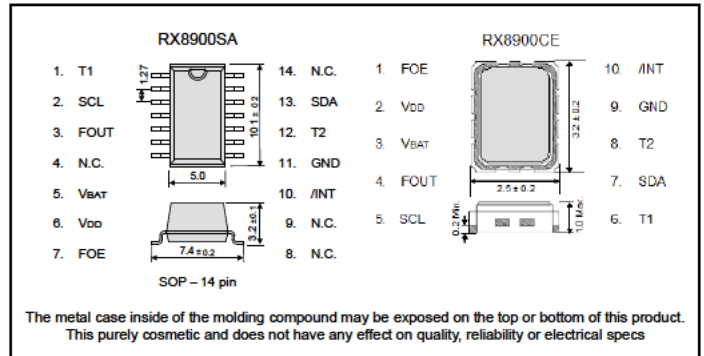
- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- High stability  
 UA:  $\pm 3.4 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 9$  s of mo. deviation)  
 UB:  $\pm 5.0 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 13$  s of mo. deviation)  
 UC:  $\pm 5.0 \times 10^{-6}$  / -30 °C to +70 °C (equiv. to  $\pm 13$  s of mo. deviation)
- Auto power switch function  
 The V<sub>DD</sub> 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

### Terminal connection / External dimensions

(Unit: mm)

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
V <sub>DD</sub>	-	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



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

tem	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Operating voltage	V <sub>DD</sub>	-	2.5	3.0	5.5	V	
Temp. compensated Voltage	V <sub>TEM</sub>	-	2.0	3.0	5.5	V	
Clock supply voltage	V <sub>CLK</sub>	-	1.6	3.0	5.5	V	
V <sub>DD</sub> detect voltage (3)	V <sub>DET3</sub>	-	2.3	2.4	2.5	V	
Operating temperature	T <sub>a</sub>	-	-40	+25	+85	°C	
Stability	$\Delta f / f$	UA	T <sub>a</sub> = -40 °C to +85 °C		$\pm 3.4$	$\times 10^{-6}$	
		UB	T <sub>a</sub> = -40 °C to +85 °C		$\pm 5.0$		
		UC	T <sub>a</sub> = -30 °C to +70 °C				
Current consumption (1)	I <sub>DD1</sub>	fSCL = 0 Hz, /INT = V <sub>DD</sub> , FOE = GND, V <sub>DD</sub> = V <sub>BAT</sub> , FOUT: OFF, Temp. Compensation interval 20 s	V <sub>DD</sub> = 5 V	-	0.72	1.5	$\mu$ A
Current consumption (2)	I <sub>DD2</sub>		V <sub>DD</sub> = 3 V	-	0.70	1.4	

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

