

# 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



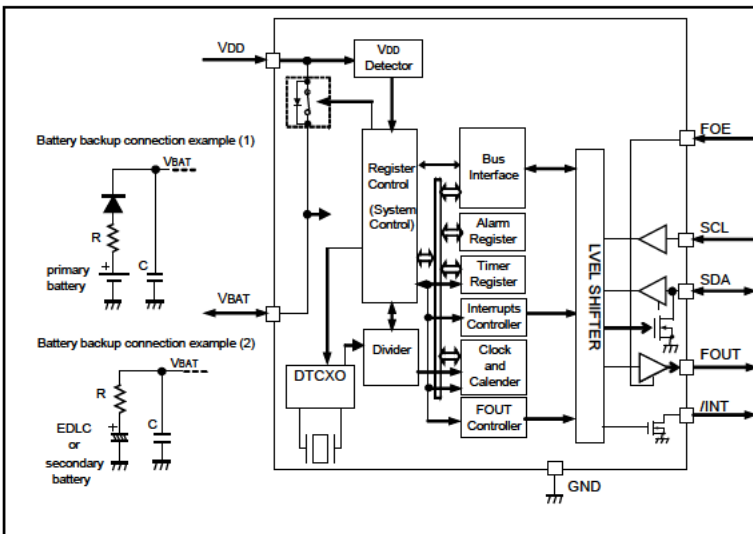
RX8900CE

( 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



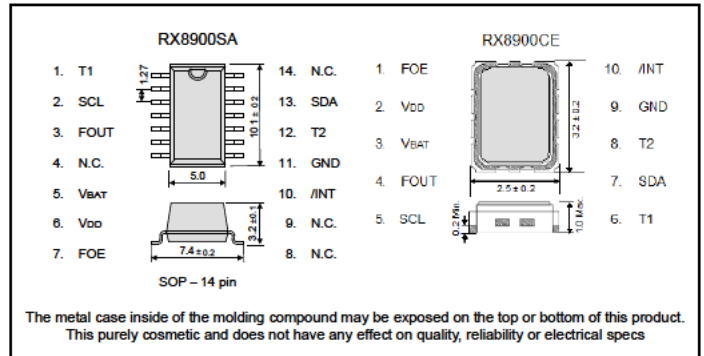
- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- High stability  
 UA:  $\pm 3.4 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 9$  s of mo. deviation)  
 UB:  $\pm 5.0 \times 10^{-6}$  / -40 °C to +85 °C (equiv. to  $\pm 13$  s of mo. deviation)  
 UC:  $\pm 5.0 \times 10^{-6}$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

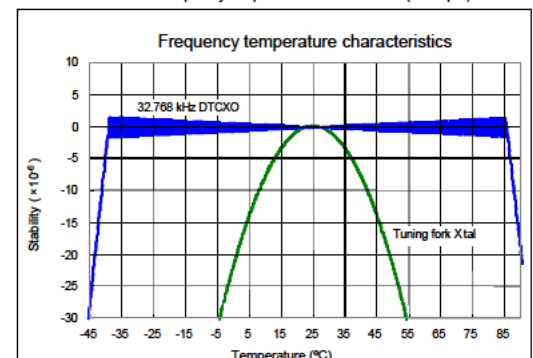


### Specifications (characteristics)

\* Refer to application manual for details

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)



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