

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

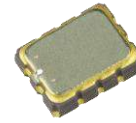
For Automotive, Power switching,  
Built-in 32.768 kHz DTCXO, High Stability



Product Number (2,000 pcs / Reel)  
**RA8900CE UA: X1B000271A00400**  
**RA8900CE UB: X1B000271A00500**

**RA8900CE**

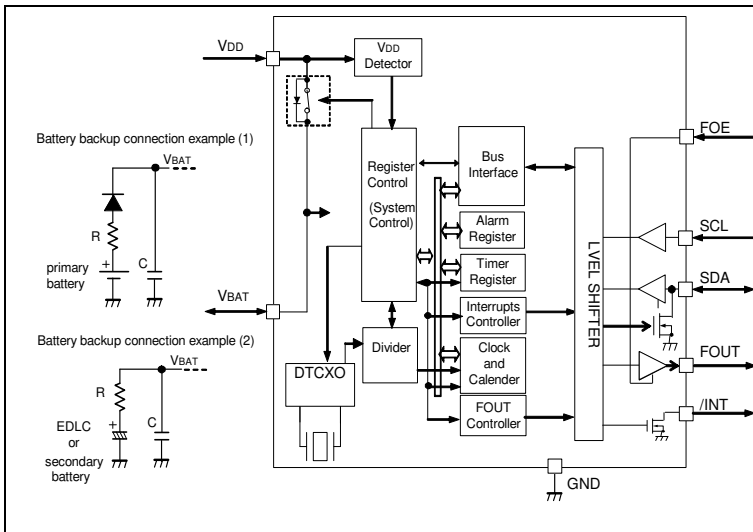
- Built-in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type : I<sup>2</sup>C-Bus
- Interface voltage range : 2.5 V to 5.5 V
- Temp. compensated voltage range : 2.0 V to 5.5 V
- Timekeeping voltage range : 1.6 V to 5.5 V
- Auto power switching function : Automatically switches to 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
- AEC-Q200 compliant



**RA8900CE**  
( 3.2 x 2.5 mm, t = 1.0 mm Max. )

**Block diagram**

**Overview**

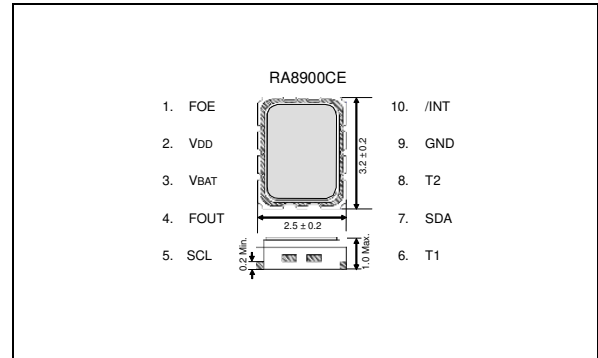


- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- High stability  
UA: ± 3.4 x 10<sup>-6</sup> / -40 °C to +85 °C (equiv. to ±9 s of mo. deviation)  
UB: ± 5.0 x 10<sup>-6</sup> / -40 °C to +85 °C (equiv. to ±13 s of mo. deviation)
- Auto power switch function  
The V<sub>DD</sub> voltage 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 μs 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)
V <sub>BAT</sub>	-	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

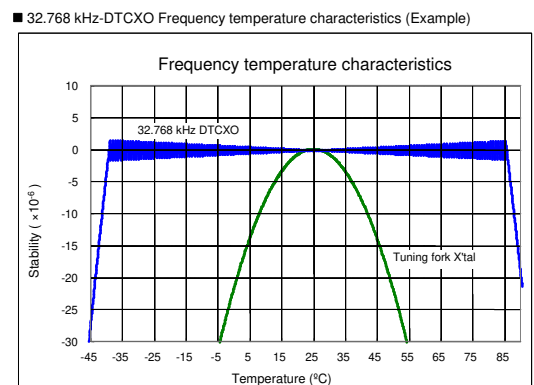


**Specifications (characteristics)**

\* Refer to application manual for details

■ Electrical Characteristics

Item	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 <sup>*1</sup>	°C	
Stability	Δ f / f	UA	T <sub>a</sub> = -40 °C to +85 °C		±3.4	x 10 <sup>-6</sup>	
		UB	T <sub>a</sub> = -40 °C to +85 °C		±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,	V <sub>DD</sub> = 5 V	-	0.72	1.5	μA
Current consumption (2)	I <sub>DD2</sub>	Temp. Compensation interval 2.0 s	V <sub>DD</sub> = 3 V	-	0.70	1.4	



\*1) Please contact us about +85 °C < T<sub>a</sub>

## 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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	► 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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