

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

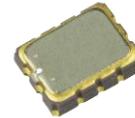
For Automotive, Power switching,  
Built-in 32.768 kHz DTCXO, High Stability



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

**RA8900CE**

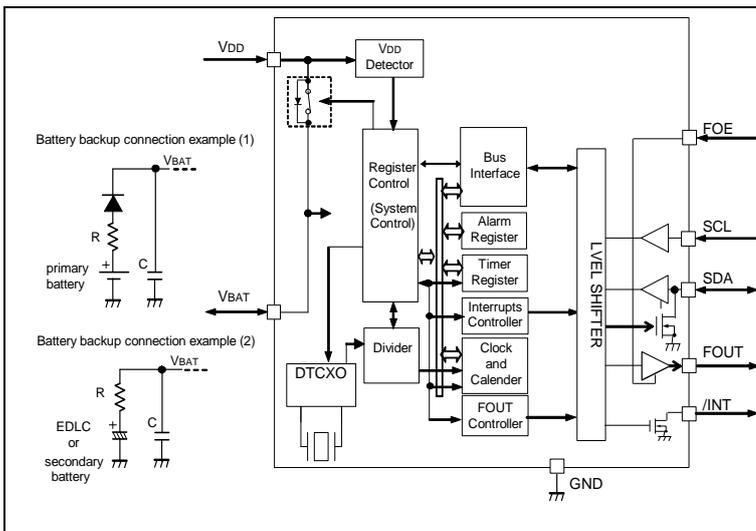
- Built-in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type : I<sup>2</sup>C-Bus
- Interface voltage range : 2.5 V to 5.5 V
- Temp. compensated voltage range : 2.0 V to 5.5 V
- Timekeeping voltage range : 1.6 V to 5.5 V
- Auto power switching function : Automatically switches to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

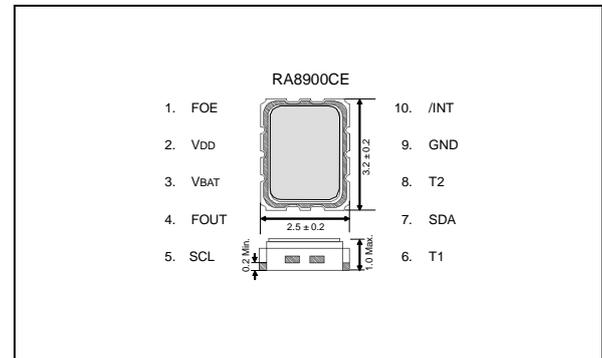


- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- High stability  
UA: ± 3.4 x 10<sup>-6</sup> / -40 °C to +85 °C (equiv. to ±9 s of mo. deviation)  
UB: ± 5.0 x 10<sup>-6</sup> / -40 °C to +85 °C (equiv. to ±13 s of mo. deviation)
- Auto power switch function  
The V<sub>DD</sub> voltage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

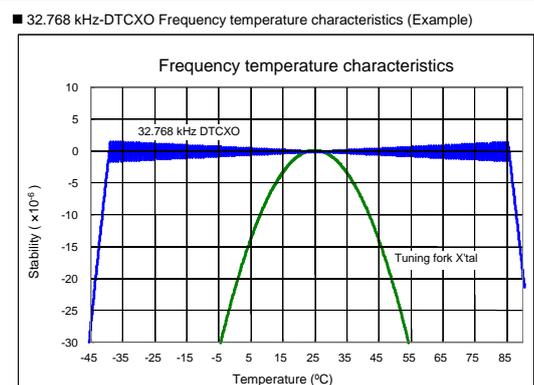


**Specifications (characteristics)**

\* 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>

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	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
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