

REAL TIME CLOCK MODULE (I²C-Bus)

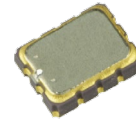
For Automotive, Power switching,
Built-in 32.768 kHz DTCXO, High Stability



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 : I²C-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
- Conforms to AEC-Q200

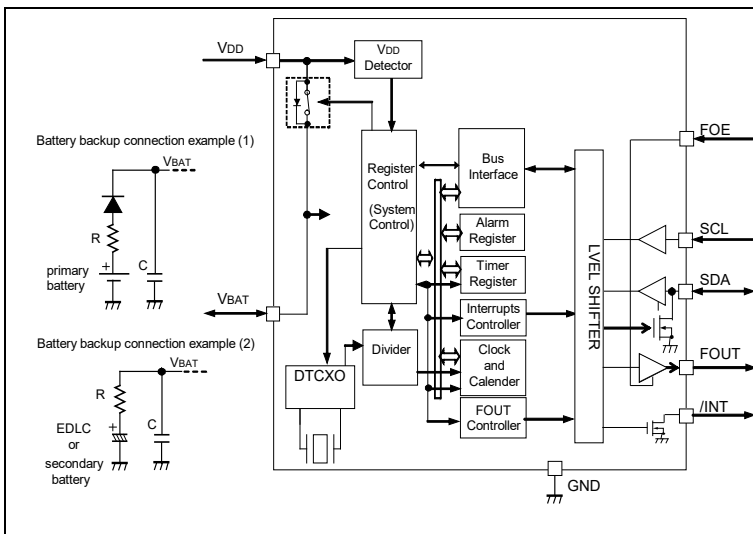


RA8900CE
(3.2 x 2.5 mm, t = 1.0 mm Max.)

The I²C-Bus is a trademark of NXP Semiconductors

Block diagram

Overview

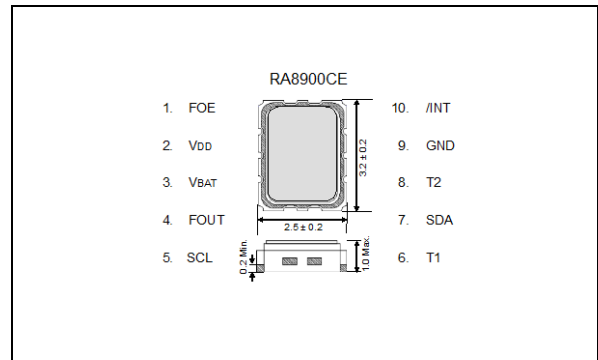


- Interface type
I²C-Bus interface Fast-Mode 400 kHz
- High stability
UA: $\pm 3.4 \times 10^{-6}$ / -40 °C to +85 °C (equiv. to ± 9 s of mo. deviation)
UB: $\pm 5.0 \times 10^{-6}$ / -40 °C to +85 °C (equiv. to ± 13 s of mo. deviation)
- Auto power switch function
The VDD voltage is monitored and it 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 μ 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 |

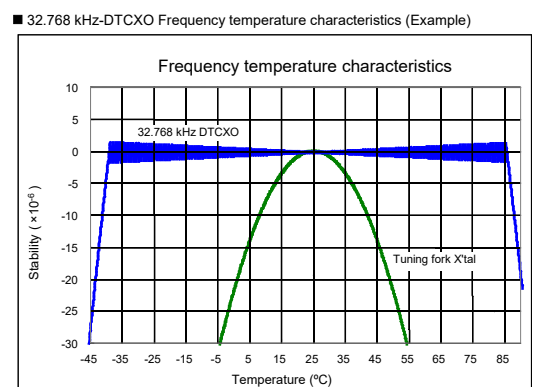


Specifications (characteristics)

* Refer to application manual for details

■ Electrical Characteristics

| 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 ^{*1} | °C | |
| Stability | $\Delta f / f$ | UA | Ta = -40 °C to +85 °C | | ± 3.4 | $\times 10^{-6}$ | |
| | | UB | Ta = -40 °C to +85 °C | | ± 5.0 | | |
| | | UC | Ta = -30 °C to +70 °C | | | | |
| Current consumption (1) | I _{DD1} | fSCL = 0 Hz, /INT = VDD, FOE = GND, VDD = VBAT, FOUT: OFF, Temp. Compensation interval 2.0 s | VDD = 5 V | - | 0.72 | 1.5 | μ A |
| Current consumption (2) | I _{DD2} | | VDD = 3 V | - | 0.70 | 1.4 | μ A |



*1) Please contact us about +85 °C < Ta

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.

► Explanation of the mark that are using it for the catalog

| | |
|---|---|
|  | ► 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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