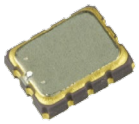
REAL TIME CLOCK MODULE (I²C-Bus)

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

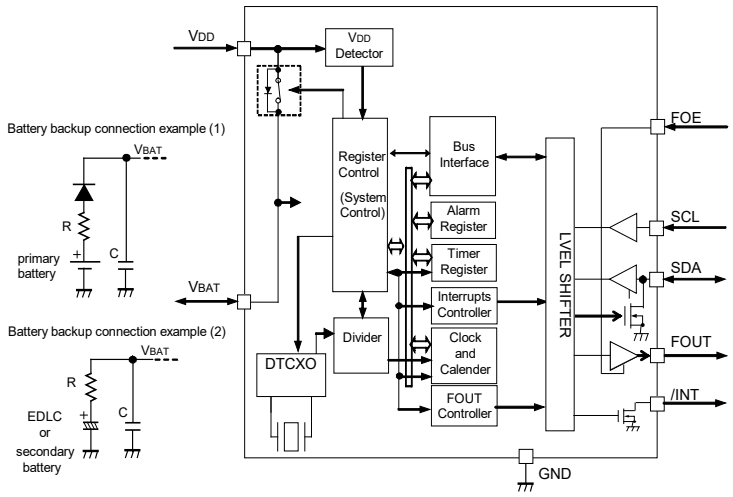
- Built-in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type : I²C-Bus
- Interface voltage range : 2.5 V to 5.5 V
- Temp. compensated voltage range : 2.0 V to 5.5 V
- Timekeeping voltage range : 1.6 V to 5.5 V
- Auto power switching function : Automatically switches to backup power 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



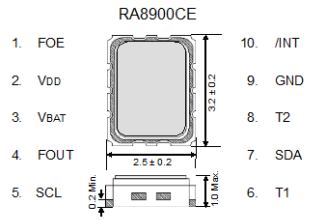
Overview

- Interface type
  I²C-Bus interface Fast-Mode 400 kHz
- High stability
  UA: ± 3.4 x 10^{-6} / -40 °C to +85 °C (equiv. to ±9 s of mo. deviation)
  UB: ± 5.0 x 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 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

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

Terminal connection / External dimensions (Unit: mm)



Specifications (characteristics)

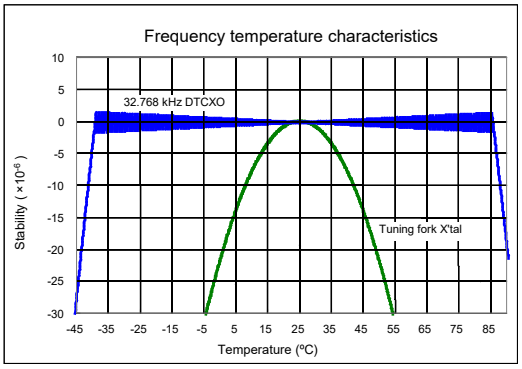
∗ Refer to application manual for details

■ 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	Δ f / f	UA	Ta = -40 °C to +85 °C		±3.4		x 10^{-6}
		UB	Ta = -40 °C to +85 °C		±5.0		
		UC	Ta = -30 °C to +70 °C				
Current consumption (1)	IDD1	fSCL = 0 Hz, /INT = VDD, FOE = GND, VDD = VBAT, FOUT: OFF, Temp. Compensation interval 2.0 s	VDD = 5 V	-	0.72	1.5	µA
Current consumption (2)	IDD2		VDD = 3 V	-	0.70	1.4	

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

■ 32.768 kHz-DTCXO Frequency temperature characteristics (Example)



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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

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).