

# REAL TIME CLOCK MODULE (I2C-Bus)

For Automotive

Built-in 32.768 kHz-DTCXO, High Stability and Power Switching

# **RA 8900 SA/CE**



•Built in frequency adjusted 32.768 kHz crystal unit and DTCXO. : I<sup>2</sup>C-Bus interface (400kHz) Interface Type

: 2.5 V to 5.5 V Interface voltage range •Temp. compensated voltage range : 2.0 V to 5.5 V

: 1.6 V to 5.5 V •Clock supply voltage range •Selectable clock output (32.768 kHz, 1024 Hz, 1 Hz)

•The various functions include full calendar, alarm, timer, temp. sensor function.

•Applications: Car audio, Car navigation system, Clock

•Conforms to AEC-Q200

\*The I<sup>2</sup>C-BUS is a trademark of NXP Semiconductors





**Product Number (Please contact us)** RA8900SA: X1B000282Axxx00 RA8900CE: X1B000271Axxx00





 $(10.1 \times 7.4 \times 3.3 \text{ mm})$ 

Actual size RA8900SA







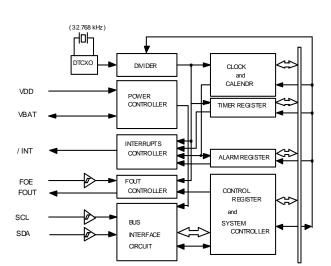
RA8900CE  $(3.2 \times 2.5 \times 1.0 \text{ mm})$ 





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# **Block diagram**



# Overview

### High Stability

± 3.4 x 10<sup>-6</sup> / -40 °C to +85 °C •UA ( Equivalent to 9 seconds of month deviation )

B ± 5.0 x 10<sup>-6</sup> / -40 °C to +85 °C (Equivalent to 13 seconds of month deviation)

± 5.0 x 10<sup>-6</sup> / -30 °C to +70 °C •UC

( Equivalent to 13 seconds of month deviation )

- 32.768 kHz frequency output function
   FOUT pin output (C-MOS output), CL=30 pF
- Output selectable: 32.768 kHz, 1024 Hz, 1 Hz

### Available automatic battery backup switch-over function

- When VDD deteriorates, internal source is switched to VBAT.
- · A very small leakage current

### • Timer function

 Timer function can be set up between 1/4096 second and 4095 minutes

### Alarm function

Alarm function can be set to day of week, day, hour, and minute.

### . Temp. sensor function

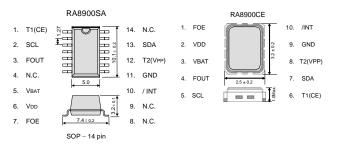
•The temperature data are output to a register by a temp. sensor function. (Bank.2\_Add17h)

# Pin Function

Signal Name	1/0	Function
T1(CE)	input	Use by the manufacture for testing. ( Do not connect externally.)
SCL	input	Serial clock input pin.
FOUT	Output	The pin outputs the reference clock signal. ( CMOS output )
VBAT	-	Battery supply.  This pin has charge capability to backup battery.
VDD	-	Connected to a positive power supply
FOE	input	The input pin for the FOUT output control.
/ INT	Output	Interrupt output (N-ch. open drain).
GND	-	Connected to a ground
T2(VPP)	-	Use by the manufacture for testing. ( Do not connect externally.)
SDA	I/O	Data input and output pin.

# Terminal connection / External dimensions

(Unit:mm)

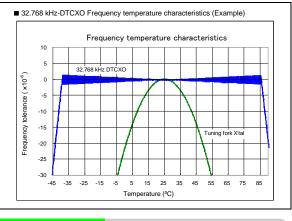


The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

# Specifications (characteristics)

### ■ Electrical Characteristics Item Symbol Conditions Min. Typ. Max. Unit Operating voltage VDD Interface voltage 2.5 3.0 5.5 V Temp. compensated Voltage Vтем Temp. compensated voltage 2.0 3.0 5.5 Clock supply voltage Vclk Internal clock 1.6 3.0 5.5 ٥С TOPR No condensation -40 +85 Operating temperature +25 Ta = -40 °C to +85 °C ±3.4 \*1 Stability $\Delta f/f$ UB Ta = -40 °C to +85 °C × 10<sup>-6</sup> ±5.0 \*2 UC Ta = -30 °C to +70 °C fSCL=0Hz, /INT=VDD, FOE =GND Current consumption (1) 0.72 IDD1 VDD = 5V μΑ OFF Current consumption (2) Temp. Compensation 0.70 1.4

# \* Refer to application manual for details.



<sup>\*2)</sup> Equivalent to 13 seconds of month deviation. 1) Equivalent to 9 seconds of month deviation.



# 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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ISO/TS16949 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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