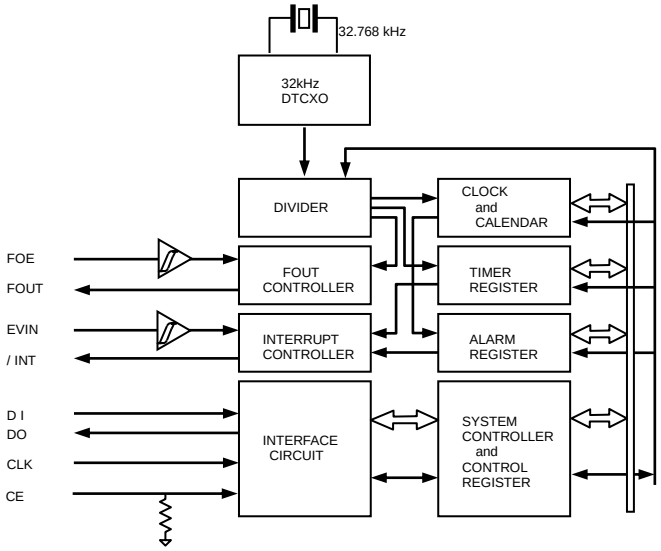
REAL TIME CLOCK MODULE (SPI-Bus)
For Automotive
Built-in 32.768 kHz-DTCXO, High Stability

RA4803SA

Product Number
RA4803SA UA: X1B000252A00100
RA4803SA UB: X1B000252A00200
RA4803SA UC: X1B000252A00300
RA4803SA AA: X1B000252A00600

- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO.
- 1/100s resolution Time register
- Interface Type : 4-wire serial interface
- Interface voltage range : 1.6 V to 5.5 V
- Temp. compensated voltage range : 2.2 V to 5.5 V
- Clock supply voltage range : 1.6 V to 5.5 V
- Selectable clock output (32.768 kHz, 1024 Hz, 1 Hz)
- The various functions include full calendar, alarm, timer, EVIN input.
- Applications : Car audio, Car navigation system, Clock
- AEC-Q200 compliant

Block diagram



Overview

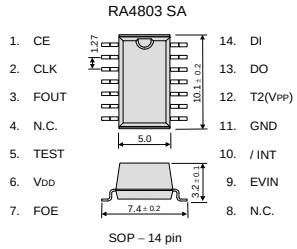
- **High Stability**
  - UA ± 3.4 x 10^{-6} / -40 ºC to +85 ºC
    (Equivalent to ±9 seconds of month deviation)
  - UB ± 5.0 x 10^{-6} / -40 ºC to +85 ºC
    (Equivalent to ±13 seconds of month deviation)
  - UC ± 5.0 x 10^{-6} / -30 ºC to +70 ºC
  - AA (+5 ± 5.0) x 10^{-6} / +25 ºC
- **High Resolution:** 1/100s Time register with capture buffer
- **32.768 kHz frequency output function**
  - FOUT pin output (C-MOS output), CL=30 pF
  - Output selectable: 32.768 kHz, 1024 Hz, 1 Hz
- **The various interrupt**
  - Timer Function can be set between 1/ 4096 second and 4095 minutes.
  - Alarm Function can be set to day of week, day, hour, or minute.
  - EVIN input.
- **Time synchronize function with 1PPS signal input**
- **Register compatibility:** upper compatible with RX-4801.

*It is possible to use it by the terminal connection as 32.768 kHz-DTCXO.

Pin Function

Signal Name	I / O	Function
CE	input	The chip enable input pin.
CLK	input	The shift clock input pin for serial data transfer.
FOUT	Output	The pin outputs the reference clock signal. (CMOS output)
TEST	input	Use by the manufacture for testing.
VDD	-	Connected to a positive power supply
FOE	input	The input pin for the FOUT output control.
EVIN	input	External event input.
/ 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.)
DO	Output	The data output pin for serial data transfer.
D I	input	The data input pin for serial data transfer.

Terminal connection / External dimensions (Unit:mm)



SOP – 14 pin

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)

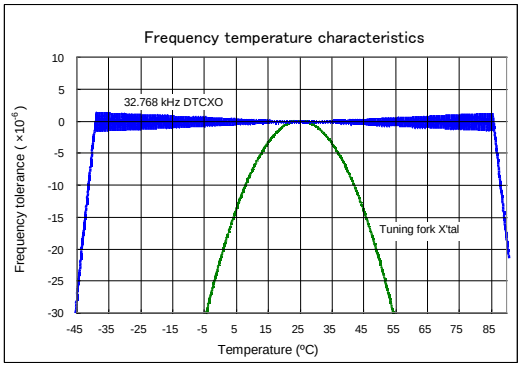
∗ **Refer to application manual for details.**

■ Electrical Characteristics

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
Interface voltage	VDD	Interface voltage		1.6	3.0	5.5	V
Temp. compensated Voltage	VTEM	Temp. compensated voltage		2.2	3.0	5.5	V
Clock supply voltage	VCLK	-		1.6	3.0	5.5	V
Operating temperature	TOPR	No condensation		-40	+25	+85	ºC
Stability	Δ f / f	UA	Ta = -40 ºC to +85 ºC	±3.4 *1			× 10^{-6}
		UB	Ta = -40 ºC to +85 ºC	±5.0 *2			
		UC	Ta = -30 ºC to +70 ºC				
		AA	Ta = +25 ºC	5 ± 5.0 *3			
Current consumption (1)	IDD1	Backup Mode FOE = GND, /INT = VDD FOUT output : OFF	VDD = 5V	-	0.75	3.4	µA
Current consumption (2)	IDD2		VDD = 3V	-	0.75	2.1	

*1) Equivalent to ±9 seconds of month deviation. *2) Equivalent to ±13 seconds of month deviation.
*3) Equivalent to ±13 seconds of month deviation. (excluding offset)

■ 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	►Pb free.
RoHS Compliant	►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.)
For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).