

REAL TIME CLOCK MODULE (SPI-Bus)

Built-in 32.768 kHz-DTCXO, +105°C operating temperature, Low current consumption, Built-in power supply switching circuit and Time stamp function up to 32 records

RX4901CE

- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type
- : 3 wire / 4 wire SPI-Bus
- •Current consumption : 240 nA / 3 V (Typ.)
- •Auto power switching function : Automatically switches to backup power supply

: Wake up every hour or every minute or every second

- by monitoring the VDD / VBAT voltage : Maximum 32 time stamps
- Time stamp function
- Interrupt output
- Alarm interruption
- : Day, date, hour, minute, second Auto repeat wakeup timer interruption
- Self-monitoring interruption : Crystal oscillation stop, V_{BAT} low, V_{DD} low

Block diagram

Pin Function



RoHS Compliant



RX4901CE XS D0 : X1B000471000715 RX4901CE XB D0 : X1B000471000815



(3.2 × 2.5 mm, t = 1.0 mm Max.)

Overview

• Interface type : 3 wire / 4 wire SPI-Bus

- High stability
- XS: ±3.0 x 10⁻⁶ / -40 °C to +85 °C (Monthly rate: ±8 seconds) : ±5.0 x 10⁻⁶ / +85 °C to +105 °C (Monthly rate: ±13.2 seconds)
- XB: ±5.0 x 10⁻⁶ / -40 °C to +85 °C (Monthly rate: ±13.2 seconds)
- : ±8.0 x 10⁻⁶ / +85 °C to +105 °C (Monthly rate: ±21 seconds) Time stamp function

Trigger source: External event (EVIN) input, voltage drop/oscillation stop status detected, command input from the host Record data: 1/1024 seconds to 1 second, seconds, minutes, hours, days, months, years

- Number of recordable events: Maximum 32 events
- Backup power supply switching function
- The VDD and VBAT voltages are monitored to switch between Normal mode (VDD operation) and Backup mode (VBAT operation). Clock output (FOUT)
- Selectable from 32.768 kHz, 1024 Hz and 1 Hz outputs

Output can be controlled by a register or FOE input (selectable with a register).

	Signal Name	I/O	Function						
	EVIN2,3	Input	External event input pins. Detectable even in Backup mode. Pull-up and pull-down is configurable by the resisters						
	CE	Input	Slave select input pin A pull-down resistor (Typ. 300 k Ω) is included						
	CLK	Input	Serial clock input pin						
	DI	Input	Serial data input pin (4 wire)						
-	DO	Output	Serial data Output pin (4 wire)						
	DIO	Input / Output	Serial data input/output pin (3 wire)						
	FOUT	Output	Frequency output pin (CMOS). 32.768 kHz (default), 1024 Hz or 1 Hz clock output is selectable. This pin can be switched to the wakeup timer interrupt output (CMOS)						
	/INT	Output	Interrupt output pin (N-ch. open drain). The wakeup timer, time update, alarm, and/or event detection interrupt signals can be selected to output from this pin. When two or more signals are selected, they are NORed before being output. This pin is effective even in Backup mode.						
	Vdd	-	Power-supply pin						
	Vout	-	Internal operating voltage output pin Connect a 1.0 µF bypass capacitor to this pin.						
	Vbat	-	Backup power supply pin Connect a backup power supply such as a large-size capacitor, secondary battery, or primary battery. The operating power voltage is supplied from this pin to the internal circuits in Backup mode.						
	GND	-	Ground pin						

Specifications (characteristics)

Recommended Operating Conditions									
Item		Symbol	Condition	Min.	Min. Typ.		Max.		unit
Operating voltage		Vdd	-	1.6	3	.0	Ę	5.5	V
Clock supply voltage		Vclk	-	1.1	3	3.0		5.5	V
Operating Temperature		Ta	-	-40	+	+25 +105		105	°C
VDD detection	voltage	-Vdet1	VDD, Fall	1.35	1.	45	1	.55	V
Frequency Characteristics									
Item	Symbol		Condition			Ту	γp.	Max	. unit
Frequency tolerance	∆f/f	xs	Ta = -40 to +85 $^{\circ}C$		-3	-	-	+3	
			Ta = +85 to +105 °C		-5		- +5		10-6
		ХВ	Ta = -40 to +85 $^{\circ}C$		-5	-	- +		× 10 ·
			Ta = +85 to +105 °C		-8	-	- +8		
start-up time	t STA	Ta = + VDD =	$T_a = +25 \ ^{\circ}C,$ VDD = 1.6 V ~ 5.5 V			0.	.5	1.0	s



* Refer to application manual for details

Cur	rent cor	nsumption				Т	a = -40	°C to +	105 °C
Item	Symbol		Condition			Min.	Тур.	Max.	unit
	IBAT	VBAT = 3.0 V, /INT= Hi-Z, FC Temperature of FSEL1= FSEL CHGEN = 0, 0	OUT: Output O compensation .0 = 1, INIEN = CE = L	FF (Hi-Z), interval: 2 = 1,	s,	-	240	1500 nA 3.0 μA	nA
	1 32k	VDD = 3.0 V, /INT= Hi-Z, FOUT: 32 kHz output, CL = 0 pF, Temperature compensation interval: 2 s, FSEL1 = FSEL0 = 0, INIEN = 1, CHGEN = 0. CE = L					1.0	3.0	μΑ
Option									
I/F	Option	EVIN pin Number	/INTpin Number	FOUT	Num Fl	ber of ti by EVIN FO Moo	ber of time stamps recorded by EVIN terminal trigge		
SPI	А	1	1	Yes	3	32 times 12 t		12 tin	nes
wire	В	2	1	-	3	32 times 22 times		nes	
SPI	С	0	1	Yes		0 time 0 time		ne	
wire	D	1	1	-	3	2 time	S	10 tin	nes

3 4

SEIKO EPSON CORPORATION



Product name

RX4901CE	XS	A0
1	2	3

- ① Model CE type package 3.2 x 2.5 x 1.0 mm
- 2 Frequency tolerance
 - XS: ±3.0 x 10⁻⁶ / -40 °C to +85 °C (Monthly rate: ±8 seconds) ±5.0 x 10⁻⁶ / +85 °C to +105 °C (Monthly rate: ±13.2 seconds) XB: ±5.0 x 10⁻⁶ / -40 °C to +85 °C (Monthly rate: ±13.2 seconds) ±8.0 x 10⁻⁶ / +85 °C to +105 °C (Monthly rate: ±21 seconds)
- ③ Pin Option
 - A: Option A
 - B: Option B
 - C: Option C
 - D: Option D

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