

REAL TIME CLOCK MODULE (I²C-Bus)

For Automotive
Built-in 32.768 kHz DTCXO, High Stability

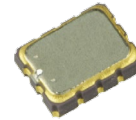


Product Number (2,000 pcs / Reel)
RA8804CE XA: X1B000381A00100
RA8804CE XB: X1B000381A00200

RA8804CE

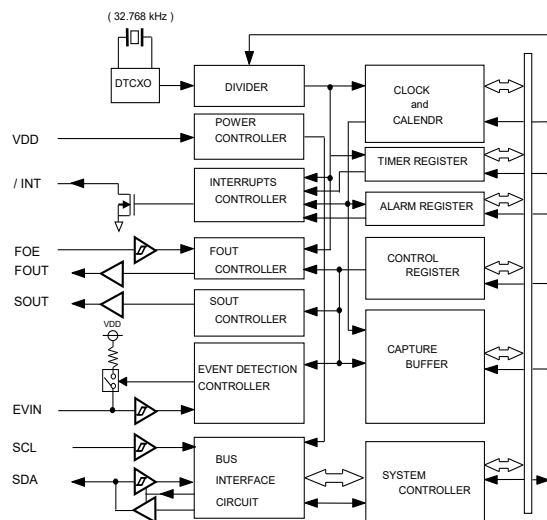
- Built in frequency adjusted 32.768 kHz crystal unit and DTCXO
- Interface Type : I²C-Bus
- Selectable clock output : 32.768 kHz, 1024 Hz, 1 Hz
- Time stamp function : 1 time stamped from year to second
- Interrupt output : Wake up every minute or every second
- Alarm interruption : Day, date, hour, minute
- Auto repeat wakeup timer interruption
- Self-monitoring interruption : Crystal oscillation stop, V_{BAT} low, V_{DD} low
- SOUT pin outputs that selected flag bit value
- Conforms to AEC-Q100

The I²C-Bus is a trademark of NXP Semiconductors



RA8804CE
(3.2 × 2.5 mm, t = 1.0 mm Max.)

Block diagram



Overview

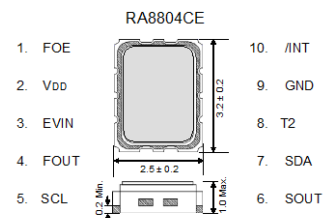
- Interface type
I²C-Bus interface Fast-Mode 400 kHz
- High stability
XA: $\pm 3.4 \times 10^{-6}$ / -40 °C to +85 °C (equivalent to ± 9 s of mo. deviation)
 $\pm 8.0 \times 10^{-6}$ / +85 °C to +105 °C (equivalent to ± 21 s of mo. deviation)
XB: $\pm 5.0 \times 10^{-6}$ / -40 °C to +85 °C (equivalent to ± 13 s of mo. deviation)
 $\pm 8.0 \times 10^{-6}$ / +85 °C to +105 °C (equivalent to ± 21 s of mo. deviation)
- Clock output function
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
- Wakeup timer function
Selectable from 244 μ s to 32 years (24 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
- Time stamp function
1 time stamped from year to second
The time stamp trigger inputs from EVIN pin, self-monitoring and I²C software command
EVIN pin has function of chattering-cancel
- Alarm function
It is possible program from day to minute
- Internal state output function
SOUT pin outputs selected flag-bit value or specified value (H or L)

Pin Function

Signal Name	I / O	Function
SOUT	Output	Internal state output pin
SCL	Input	Serial clock input pin
FOUT	Output	Frequency output pin (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz)
EVIN	Input	Event input pin
V _{DD}	-	Power-supply pin
FOE	Input	The FOUT output control pin
/INT	Output	Interrupts output by Alarm and Timer events (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)



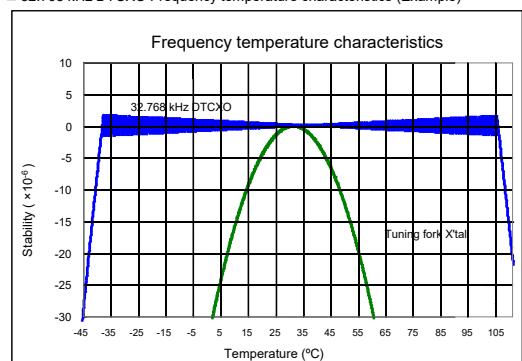
Specifications (characteristics)

* Refer to application manual for details

Electrical Characteristics

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit	
Operating voltage	V _{DD}	-		1.6	3.0	5.5	V	
Temp. compensated Voltage	V _{TEM}	-		1.5	3.0	5.5	V	
Clock supply voltage	V _{CLK}	-		1.5	3.0	5.5	V	
Operating temperature	T _a	-		-40	+25	+105	°C	
Stability	Δ f / f	XA	T _a = -40 °C to +85 °C	±3.4			x 10 ⁻⁶	
			T _a = +85 °C to +105 °C	±8.0				
		XB	T _a = -40 °C to +85 °C	±5.0				
			T _a = +85 °C to +105 °C	±8.0				
Current consumption (1)	I _{DD1}	fSCL = 0 Hz, /INT = V _{DD} , FOE = GND, FOUT: OFF,		V _{DD} = 5 V	-	0.4	1.6	μA
Current consumption (2)	I _{DD2}	Temp. Compensation interval 2.0 s		V _{DD} = 3 V	-	0.35	1.5	

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.

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	► 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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