

REAL TIME CLOCK MODULE (I²C-Bus)

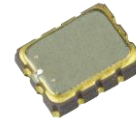
For Automotive
Built-in 32.768 kHz DTCXO, High Stability



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

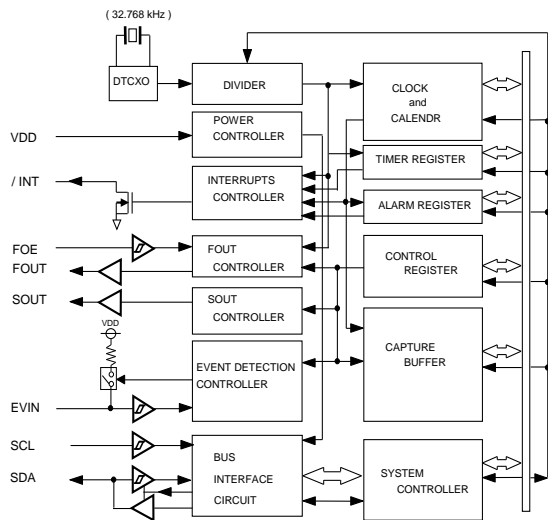
RA8804CE

- 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
- AEC-Q100 compliant



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

Block diagram



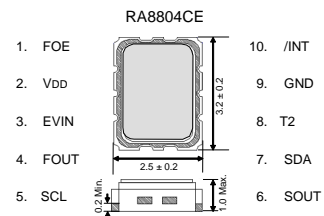
Overview

- Interface type
I²C-Bus interface Fast-Mode 400 kHz
- High stability
XA: $\pm 3.4 \times 10^{-6} / -40 \text{ }^\circ\text{C to } +85 \text{ }^\circ\text{C}$ (equivalent to $\pm 9 \text{ s of mo. deviation}$)
 $\pm 8.0 \times 10^{-6} / +85 \text{ }^\circ\text{C to } +105 \text{ }^\circ\text{C}$ (equivalent to $\pm 21 \text{ s of mo. deviation}$)
XB: $\pm 5.0 \times 10^{-6} / -40 \text{ }^\circ\text{C to } +85 \text{ }^\circ\text{C}$ (equivalent to $\pm 13 \text{ s of mo. deviation}$)
 $\pm 8.0 \times 10^{-6} / +85 \text{ }^\circ\text{C to } +105 \text{ }^\circ\text{C}$ (equivalent to $\pm 21 \text{ s of mo. deviation}$)
- Clock output function
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
- Wakeup timer function
Selectable from 244 μs 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)



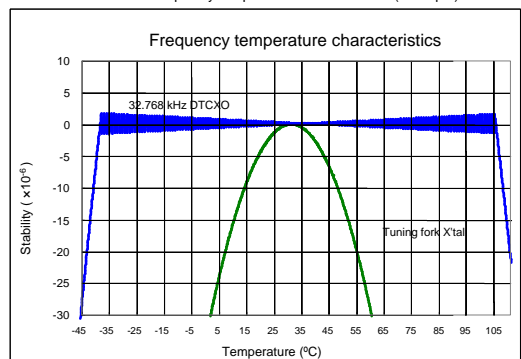
Specifications (characteristics)

* 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	$\Delta f / f$	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	μA

32.768 kHz DTCXO Frequency temperature characteristics (Example)



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	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
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