

REAL TIME CLOCK MODULE (SPI-Bus)

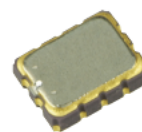
Time stamp function and Low current consumption

RX4111CE

- Built in frequency adjusted 32.768 kHz crystal unit
- Interface Type : SPI -Bus 4 wire
- Low backup current : 100 nA Typ. / 3 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the VDD voltage.
- Time stamp function : 8 times stamped from year to 1/256 seconds
- Interrupt output : Wake up every minute or every second
- Alarm interruption : Day, date, hour, minute, second
- Auto repeat wakeup timer interruption
- Self-monitoring interruption : Crystal oscillation stop, VBAT low, VDD low

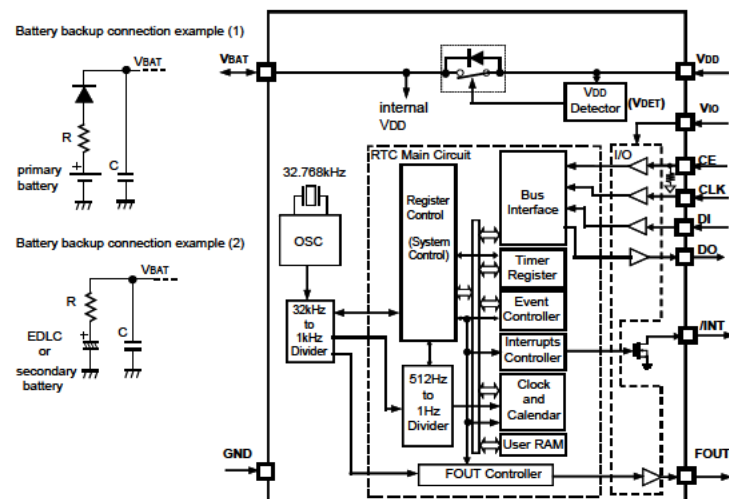


Product Number (2,000 pcs / Reel)
RX4111CE A : X1B000431000115
RX4111CE B : X1B000431000215



RX4111CE
(3.2 x 2.5 mm, t = 1.0 mm Max.)

Block diagram



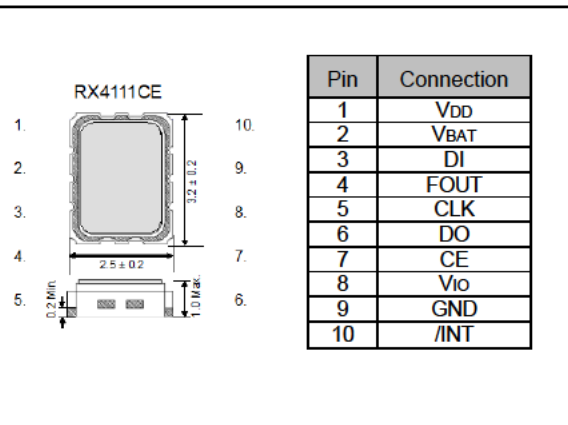
Overview

- Interface type
SPI-Bus interface (4 wire, 4 MHz Max.)
- Auto power switch function
The VDD voltage is monitored and it switches to the backup power supply by the automatic operation
Backup power supply switching voltage 1.2V Min.
- Clock output function
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
When the clock output is not used, the FOUT pin can be used as a timer output pin (CMOS)
- 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
8 times stamped from year to 1/256 seconds
The time stamp trigger inputs from self-monitoring and SPI command
- Alarm function
It is possible program from year to second
- Self-monitoring interruption
Crystal oscillation stop, VBAT low, VDD low

Pin Functin

| Signal Name | I / O | Function |
|-------------|--------|--|
| CE | Input | Chip enables input pin |
| CLK | Input | Serial clock input pin |
| DI | Input | Serial data input pin |
| DO | Output | Serial data output pin |
| FOUT | Output | Frequency output (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz) |
| /INT | Output | Interrupts output by Alarm and Timer events (N-ch. open drain) |
| VDD | - | Power supply pin Possible to supply different voltage from VIO |
| VIO | - | Interface power supply pin Input to supply the voltage same as a host |
| VBAT | - | Power supply pin for backup battery Connect an EDLC, a secondary battery, a primary battery In the backup voltage range, supplied to IC, from this pin |
| GND | - | Ground pin |

Terminal connection / External dimensions (Unit: mm)



Specifications (characteristics)

* Refer to application manual for details

Recommended Operating Conditions

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------|--------|------------|------|------|------|------|
| Operating supply voltage | VDD | - | 1.6 | 3.0 | 5.5 | V |
| Clock supply voltage | VCLK | - | 1.1 | 3.0 | 5.5 | V |
| Operating temperature | Ta | - | -40 | +25 | +85 | °C |
| VDD detect voltage | -VDET1 | VDD, Fall | 1.20 | 1.40 | 1.60 | V |

Frequency characteristics

| tem | Grade | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------|-------|----------------|----------------------------|-------|------|-------|--------------------|
| Frequency tolerance | A | $\Delta f / f$ | Ta = +25 °C VDD = 3.0 V | -11.5 | - | +11.5 | x 10 ⁻⁶ |
| | B | | | -23 | - | +23 | |
| Oscillation start-up time | tSTA | | VDD = 2.75 V to 5.5 V | - | 0.3 | 1.0 | s |

Current consumption characteristics

Ta = -40 °C to +85 °C

| tem | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|--------|---|------|------|------|---------|
| Current consumption | IBAT | Input pins = "L", FOUT = OFF, /INT = OFF, VBAT = 3.0 V, VDD = VIO = 0.0 V, CHGEN = 0b, NEN = 0b, SWSEL0 = 1, SWSEL1 = 0 | - | 100 | 450 | nA |
| | I32k | Input pins = "L", FOUT = 32.768 kHz, /INT = OFF, VDD = VIO = 3.0 V, FOUT pin CL = 15 pF, CHGEN = 0b, NEN = 1b | - | 2.0 | 3.0 | μ A |

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| | |
|---|---|
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