

REAL TIME CLOCK MODULE (I²C-Bus)

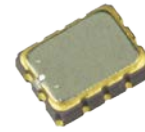
Time stamp function and Low current consumption



Product Number (2,000 pcs / Reel)
 RX8111CE A : X1B000421000115
 RX8111CE B : X1B000421000215

RX8111CE

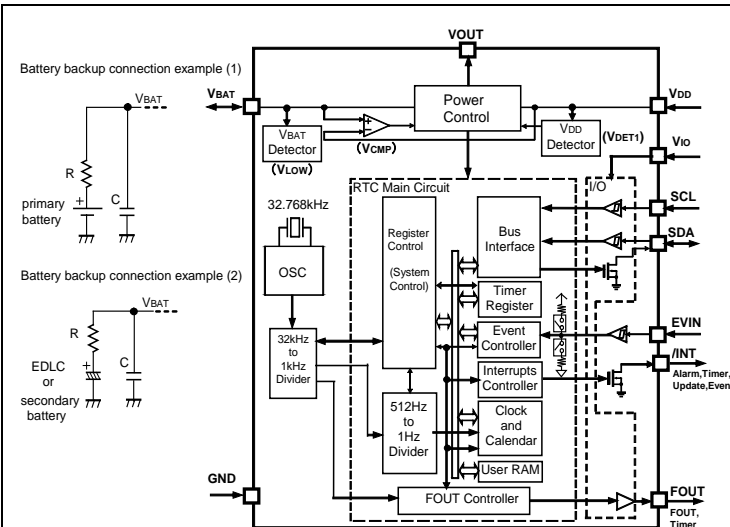
- Built in frequency adjusted 32.768 kHz crystal unit
- Interface Type : I²C -Bus
- Low backup current : 100 nA Typ. / 3 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the V_{DD} voltage
- Time stamp function : 8 times stamped from year to 1/256 seconds
- 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, V_{BAT} low, V_{DD} low



RX8111CE
 (3.2 x 2.5 mm, t = 1.0 mm Max.)

The I²C-Bus is a trademark of NXP Semiconductors

Block diagram



Overview

- Interface type
I²C-Bus interface Fast-Mode 400 kHz
- Auto power switch function
The V_{DD} voltage is monitored and it switches to the backup power supply by the automatic operation
Backup power supply switching voltage 1.2 V 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 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
- Time stamp function
8 times stamped from year to 1/256 seconds
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 year to second
- Self-monitoring interruption
Crystal oscillation stop, V_{BAT} low, V_{DD} low

Pin Functin

| Signal Name | I / O | Function |
|------------------|----------------|---|
| EVIN | Input | External event input pin (Pull up/down and polarity are selectable by software) |
| SCL | Input | Serial clock input pin |
| SDA | Input / Output | Serial data input and output pin |
| FOUT | Output | Frequency output pin (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz) |
| /INT | Output | Interrupts output by Alarm and Timer events (N-ch. open drain) |
| V _{DD} | - | Power-supply pin Possible to supply different voltage from V _{IO} |
| V _{IO} | - | Interface power supply pin Input to supply the voltage same as a host |
| V _{OUT} | - | Internal voltage output pin Connect bypass capacitor of 1.0 μF |
| V _{BAT} | - | This is a 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)

| Pin | Connection |
|-----|------------------|
| 1 | V _{DD} |
| 2 | V _{OUT} |
| 3 | V _{BAT} |
| 4 | FOUT |
| 5 | SCL |
| 6 | EVIN |
| 7 | SDA |
| 8 | V _{IO} |
| 9 | GND |
| 10 | /INT |

Specifications (characteristics)

* Refer to application manual for details

Recommended Operating Conditions

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|--------------------------------|--------------------|------------------------|------|------|------|------|
| Operating supply voltage | V _{DD} | - | 1.6 | 3.0 | 5.5 | V |
| Clock supply voltage | V _{CLK} | - | 1.1 | 3.0 | 5.5 | V |
| Operating temperature | T _a | - | -40 | +25 | +85 | °C |
| V _{DD} detect voltage | -V _{DET1} | V _{DD} , Fall | 1.20 | 1.40 | 1.60 | V |

Frequency characteristics

| Item | Grade | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------------|-------|------------------|--|-------|------|-------|--------------------|
| Frequency tolerance | A | Δf / f | T _a = +25 °C V _{DD} = 3.0 V | -11.5 | - | +11.5 | x 10 ⁻⁶ |
| | B | | | -23 | - | +23 | |
| Oscillation start-up time | | t _{STA} | V _{DD} = 2.75 V to 5.5 V | - | 0.3 | 1.0 | s |

Current consumption characteristics

T_a = -40 °C to +85 °C

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---------------------|------------------|---|------|------|------|------|
| Current consumption | I _{BAT} | SCL = SDA = " L", FOUT = OFF, /INT = OFF, V _{BAT} = 3.0 V, V _{DD} = V _{IO} = 0.0 V, CHGEN = 0b, INIEN = 0b, SWSEL0 = 1, SWSEL1 = 0 | - | 100 | 450 | nA |
| | I _{32k} | FOUT = 32.768 kHz, /INT = OFF, V _{DD} = V _{IO} = 3.0 V, FOUT pin CL = 15 pF | - | 2.0 | 3.0 | μA |

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