

REAL TIME CLOCK MODULE (I²C-Bus)

Low current consumption

RX8010SJ

NEW



Product Number (Please contact us)
RX8010SJ : X1B000242xxxx00

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : I²C-Bus interface (400 kHz)
- Operating voltage range : 1.6 V to 5.5 V
- Wide Timekeeper voltage range : 1.1 V to 5.5 V
- Low backup current : 160 nA / 3 V (Typ.)
- Frequency output function : C-MOS or Open-Drain output
- Built-in user RAM : 128 bit (8 bit x 16, SRAM)
- The various functions include full calendar, alarm, timer, etc.
- This product is conform to industrial standard SOP8 package, and it can be mounted to the common land pattern.

Epson is prepared Linux driver for this product.
(http://www5.epsondevice.com/en/quartz/tech/linux_for_rtc/index.html)

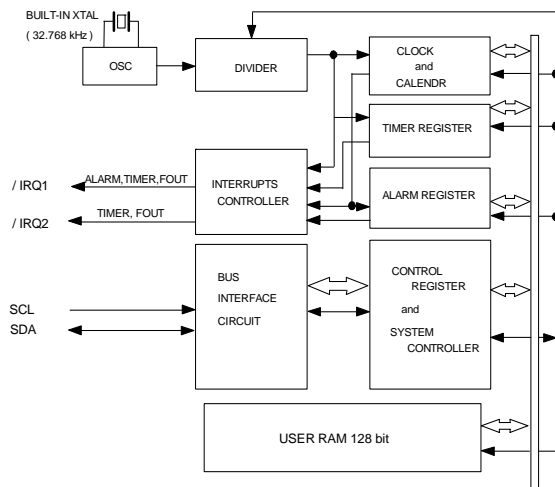
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The I²C-Bus is a trademark of NXP Semiconductors



Actual size



Block diagram



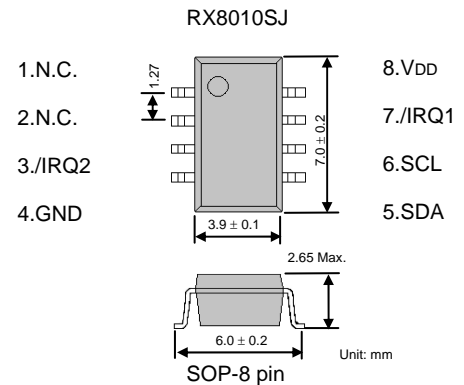
Overview

- **Interface Type**
 - I²C-Bus high-speed bus specifications. (400 kHz)
- **Frequency output function**
 - It may select a CMOS or open drain output
 - Output frequency can be selected as 32.768kHz, 1024Hz, 1Hz.
- **Timer function**
 - Timer function can be set up between 1/4096 second and 65535 hours.
 - Timing period are 1hour, 1min, 64Hz, 4096Hz.
 - It is recorded automatic to TF-bit at the time of event occurrence, and possible to output with /IRQ1 or /IRQ2 pin.
- **Alarm function**
 - Alarm function can be set to day of week, day, hour, and minute.
 - It is recorded automatic to AF-bit at the time of event occurrence, and possible to output with /IRQ1 pin.
- **User RAM**
 - 128 bit (8 bit x 16, SRAM)

Pin Function

| Signal Name | Input / Output | Function |
|-------------|----------------|---------------------------------------------------------------------------------------------------------------------------------|
| SCL | Input | This is a shift clock input pin for serial data transmission. |
| SDA | Input/Output | This is the data input/output pin for serial data transfer. |
| /IRQ1 | Output | This pin outputs interrupt signals ("L" level) for alarm, timer, time update, and 32.768kHz. This is an N-ch open-drain output. |
| /IRQ2 | Output | This pin outputs interrupt signals ("L" level) for timer and FOUT. This is a C-MOS output. |
| VDD | Supply | This is a power-supply pin. |
| GND | Supply | This pin is connected to a ground. |

Terminal connection / External dimensions (Unit:mm)



The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality, reliability or electrical specs.

Specifications (characteristics)

* Refer to application manual for details.

Recommended Operating Conditions

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|--------|------------|------|------|------|------|
| Power voltage | VDD | — | 1.6 | 3.0 | 5.5 | V |
| Clock voltage | VCLK | — | 1.1 | 3.0 | 5.5 | V |
| Operating temperature | TOPR | — | -40 | +25 | +85 | °C |

Frequency characteristics

| Item | Symbol | Conditions | Rating | Unit |
|---------------------------|----------------|----------------------------------------------------------------------------------|------------------|--------------------|
| Frequency tolerance | $\Delta f / f$ | Ta = +25 °C VDD = 3.0 V | B: 5 ± 23 * | × 10 ⁻⁶ |
| Oscillation Start-up time | tSTA | Ta = +25 °C VDD = 1.6 V ~ 5.5 V Ta = -40 °C to +85 °C VDD = 1.6V ~ 5.5V | 1 Max. 3 Max. | s |

*Equivalent to 1 minute of monthly deviation

Current consumption characteristics

Ta = -40 °C to +85 °C

| Item | Symbol | Conditions | Min. | Typ. | Max. | Unit | |
|---------------------|------------------|------------------------------------------------------------------|-----------|------|------|------|----|
| Current Consumption | I _{bk} | Input pins are "L" fCLK = 0 Hz, /IRQ1,2 = OFF TSEL2="1" | VDD = 5 V | - | - | 350 | nA |
| | | | VDD = 3 V | - | 160 | 320 | nA |
| | I _{32k} | fCLK = 0 Hz, /IRQ1: 32.768 kHz ON, /IRQ2: OFF | VDD = 5 V | - | 0.60 | 1.10 | μA |
| | | | VDD = 3 V | - | 0.52 | 0.90 | μA |

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