REAL TIME CLOCK MODULE (I²C-Bus)

Low current consumption

RX8010 SJ

- 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 voltage for time keeping: 1.1 V to 5.5 V
- Low backup current: 180 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 conformed to industrial standard SOP8 package, and it can be mounted to the common land pattern.
- Epson prepared Linux driver for development.

**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 is 1 hour, 1 min, 64Hz, 4096Hz.
- It is recorded automatic to 1T-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**

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

**Overview**

**Block diagram**

**Terminal connection / External dimensions (Unit:mm)**

- Refer to application manual for details.

**Specifications (characteristics)**

- **Recommended Operating Conditions**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power voltage</td>
<td>VDD</td>
<td>—</td>
<td>1.6</td>
<td>3.0</td>
<td>5.5</td>
<td>V</td>
</tr>
<tr>
<td>Clock voltage</td>
<td>VDD</td>
<td>—</td>
<td>1.1</td>
<td>3.0</td>
<td>5.5</td>
<td>V</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Tmin</td>
<td>—</td>
<td>-40</td>
<td>+25</td>
<td>+85</td>
<td>°C</td>
</tr>
</tbody>
</table>

- **Current consumption characteristics**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Consumption</td>
<td>Idc</td>
<td>Input pins are &quot;L&quot;</td>
<td>ICLK = 0 Hz, /IRQ1 = 2 = OFF, TSEL2 = 1</td>
<td>VDD = 5 V</td>
<td>-</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VDD = 3 V</td>
<td>-</td>
<td>160</td>
<td>320</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ICLK = 0 Hz, /IRQ1: 32.768 kHz ON, /IRQ2: OFF</td>
<td>VDD = 5 V</td>
<td>-</td>
<td>0.60</td>
<td>1.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VDD = 3 V</td>
<td>-</td>
<td>0.52</td>
<td>0.90</td>
</tr>
</tbody>
</table>

*Equivalent to 1 minute of monthly deviation
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