

**REAL TIME CLOCK MODULE (I<sup>2</sup>C-Bus)**

# RX - 8581 SA / JE / NB

- Built-in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : I<sup>2</sup>C-Bus Interface (400 kHz)
- Operating voltage range : 1.8 V to 5.5 V
- Wide Timekeeper voltage range : 1.6 V to 5.5 V
- Low backup current : 0.45  $\mu$ A / 3 V (Typ.)
- 32.768 kHz frequency output function : C-MOS output With Control Pin
- The various functions include full calendar, alarm, timer.

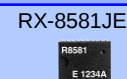
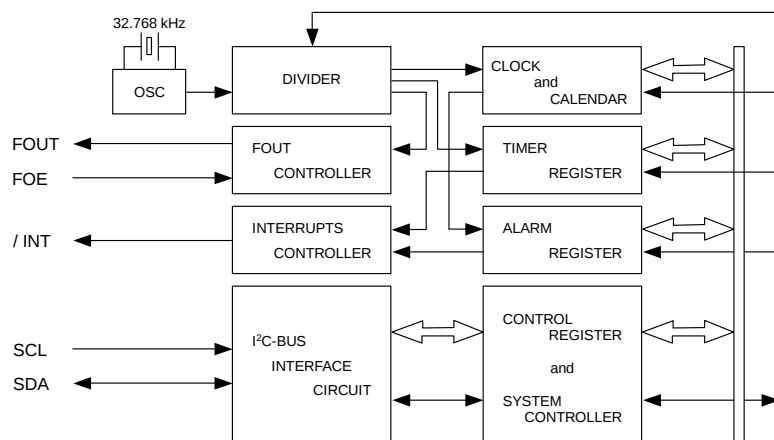
\* The I<sup>2</sup>C-Bus is a trademark of NXP Semiconductors



Product Number (Please contact us)  
**RX-8581SA : Q41858152000200**  
**RX-8581JE : Q41858171000200**  
**RX-8581NB : Q41858192000200**



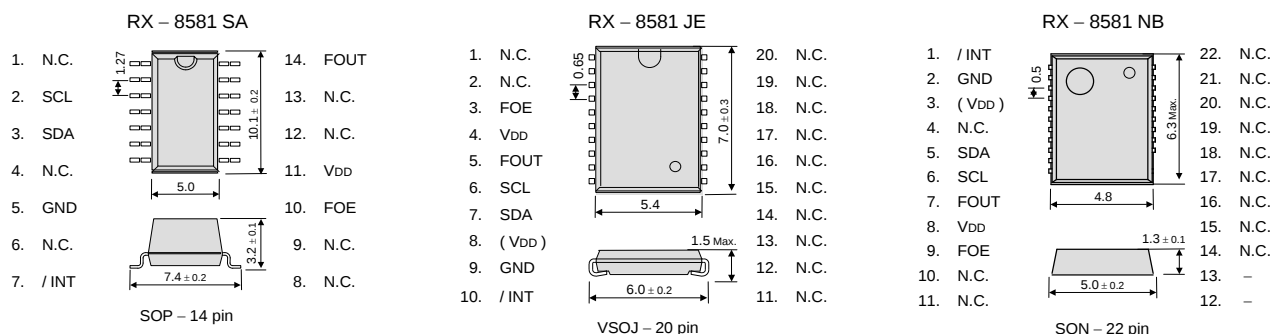
Actual size


**Block diagram**

**Overview**

- **Interface Type**
  - I<sup>2</sup>C-Bus interface. ( Hi-speed bus specifications 400 kHz )
  - \* I<sup>2</sup>C-Bus slave address : read A3h and write A2h
- **32.768 kHz frequency output function**
  - FOUT pin output (C-MOS output ), CL=30 pF
  - 32.768 kHz clock frequency output. (Duty 50  $\pm$  5 %)
- **Timer function**
  - Timer interrupt function can be set up between 1/4096 second and 4095 minutes.
  - It is recorded automatic to TF-bit at the time of event occurrence, and possible to output with /TIRQ pin output (N-ch open-drain output).
- **Interrupt function**
  - Alarm interrupt function, Time update interrupt function.

**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    | —          | 1.8  | 3.0  | 5.5  | V    |
| Clock voltage         | VCLK   | —          | 1.6  | 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<br>VDD = 3.0 V                    | B: 5 $\pm$ 23 * | $\times 10^{-6}$ |
| FOUT output Duty    | tw / t         | Ta = -40 °C to +85 °C<br>VDD = 2.4 V to 5.5 V | 50 $\pm$ 5      | %                |

\* Please ask for tighter tolerance. ( Equivalent to  $\pm 1$  minute of monthly deviation )

**Current consumption characteristics**

Ta = -40 °C to +85 °C

| Item                | Symbol | Conditions                                | Min.      | Typ. | Max. | Unit         |
|---------------------|--------|-------------------------------------------|-----------|------|------|--------------|
| Current Consumption | IBK    | f <sub>SCL</sub> = 0 Hz<br>FOE = GND      | VDD = 5 V | -    | 0.65 | 1.2 $\mu$ A  |
|                     |        | FOUT ; output OFF ( LOW )                 | VDD = 3 V | -    | 0.45 | 0.8 $\mu$ A  |
|                     | I32k   | f <sub>SCL</sub> = 0 Hz<br>FOE = VDD      | VDD = 5 V | -    | 8.0  | 20.0 $\mu$ A |
|                     |        | FOUT ; 32.768 kHz output ON<br>CL = 30 pF | VDD = 3 V | -    | 5.0  | 12.0 $\mu$ A |

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ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

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|                                                                                     |                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | ► Pb free.                                                                                                                                                                                                                      |
|  | ► Complies with EU RoHS directive.<br>*About the products without the Pb-free mark.<br>Contains Pb in products exempted by EU RoHS directive.<br>(Contains Pb in sealing glass, high melting temperature type solder or other.) |
|  | ► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.                                                                                                                      |
|  | ► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).                                                                                                                      |

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