

REAL TIME CLOCK MODULE (I²C-Bus)

RX-8581 SA/ JE/ NB

- Built-in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : I²C-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 μA / 3 V (Typ.)
- 32.768 kHz frequency output function : C-MOS output With Control Pin
- The various functions include full calendar, alarm, timer.

* The I²C-Bus is a trademark of NXP Semiconductors



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

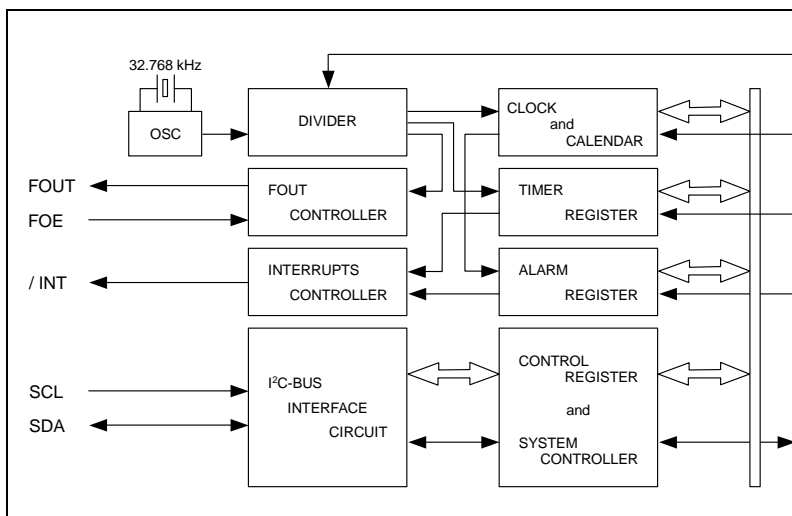


Actual size



Block diagram

Overview



- **Interface Type**
 - I²C-Bus interface. (Hi-speed bus specifications 400 kHz)
 - * I²C-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 ±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)

| RX - 8581 SA | | RX - 8581 JE | | RX - 8581 NB | |
|--------------|---------------------|-----------------------|----------|-----------------------|----------|
| 1. N.C. | 14. FOUT | 1. N.C. | 20. N.C. | 1. /INT | 22. N.C. |
| 2. SCL | 13. N.C. | 2. N.C. | 19. N.C. | 2. GND | 21. N.C. |
| 3. SDA | 12. N.C. | 3. FOE | 18. N.C. | 3. (V _{DD}) | 20. N.C. |
| 4. N.C. | 11. V _{DD} | 4. V _{DD} | 17. N.C. | 4. N.C. | 19. N.C. |
| 5. GND | 10. FOE | 5. FOUT | 16. N.C. | 5. SDA | 18. N.C. |
| 6. N.C. | 9. N.C. | 6. SCL | 15. N.C. | 6. SCL | 17. N.C. |
| 7. /INT | 8. N.C. | 7. SDA | 14. N.C. | 7. FOUT | 16. N.C. |
| | | 8. (V _{DD}) | 13. N.C. | 8. V _{DD} | 15. N.C. |
| | | 9. GND | 12. N.C. | 9. FOE | 14. N.C. |
| | | 10. /INT | 11. N.C. | 10. N.C. | 13. - |
| | | | | 11. N.C. | 12. - |

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 | V _{DD} | — | 1.8 | 3.0 | 5.5 | V |
| Clock voltage | V _{CLK} | — | 1.6 | 3.0 | 5.5 | V |
| Operating temperature | T _{OPR} | — | -40 | +25 | +85 | °C |

Frequency characteristics

| Item | Symbol | Conditions | Rating | Unit |
|---------------------|---------|---|-------------|--------------------|
| Frequency tolerance | Δ f / f | T _a = +25 °C V _{DD} = 3.0 V | B: 5 ± 23 * | × 10 ⁻⁶ |
| FOUT output Duty | tw / t | T _a = -40 °C to +85 °C V _{DD} = 2.4 V to 5.5 V | 50 ± 5 | % |

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

Current consumption characteristics

| Item | Symbol | Conditions | T _a = -40 °C to +85 °C | | | | |
|---------------------|------------------|--|-----------------------------------|------|------|------|----|
| | | | Min. | Typ. | Max. | Unit | |
| Current Consumption | I _{BK} | f _{SCL} = 0 Hz FOE = GND | V _{DD} = 5 V | - | 0.65 | 1.2 | μA |
| | | FOUT ; output OFF (LOW) | V _{DD} = 3 V | - | 0.45 | 0.8 | |
| | I _{32k} | f _{SCL} = 0 Hz FOE = V _{DD} | V _{DD} = 5 V | - | 8.0 | 20.0 | μA |
| | | FOUT ; 32.768 kHz output ON CL = 30 pF | V _{DD} = 3 V | - | 5.0 | 12.0 | |

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At Seiko Epson, all environmental initiatives operate under the Plan-Do-Check-Action (PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard.

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| | |
|---|---|
|  | ► Pb free. |
|  | ► Complies with EU RoHS directive. *About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (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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