

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 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 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

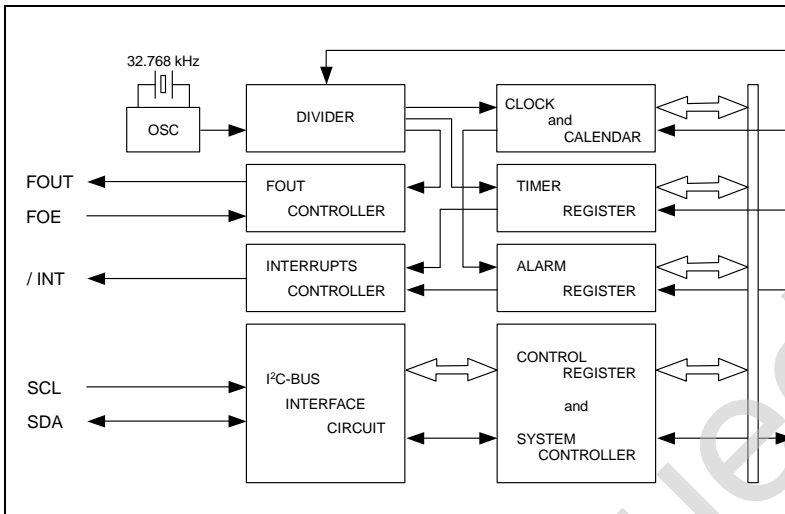


Actual size



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 ±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 <sub>DD</sub> )	20. N.C.
4. N.C.	11. V <sub>DD</sub>	4. V <sub>DD</sub>	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 <sub>DD</sub> )	13. N.C.	8. V <sub>DD</sub>	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 <sub>DD</sub>	—	1.8	3.0	5.5	V
Clock voltage	V <sub>CLK</sub>	—	1.6	3.0	5.5	V
Operating temperature	T <sub>OPR</sub>	—	-40	+25	+85	°C

Frequency characteristics

Item	Symbol	Conditions	Rating	Unit
Frequency tolerance	Δ f / f	T <sub>a</sub> = +25 °C V <sub>DD</sub> = 3.0 V	B: 5 ± 23 *	× 10 <sup>-6</sup>
FOUT output Duty	tw / t	T <sub>a</sub> = -40 °C to +85 °C V <sub>DD</sub> = 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 <sub>a</sub> = -40 °C to +85 °C				
			Min.	Typ.	Max.	Unit	
Current Consumption	I <sub>BK</sub>	f <sub>SCL</sub> = 0 Hz FOE = GND FOUT ; output OFF ( LOW )	V <sub>DD</sub> = 5 V	-	0.65	1.2	μA
		V <sub>DD</sub> = 3 V	-	0.45	0.8		
Current Consumption	I <sub>32k</sub>	f <sub>SCL</sub> = 0 Hz FOE = V <sub>DD</sub> FOUT ; 32.768 kHz output ON CL = 30 pF	V <sub>DD</sub> = 5 V	-	8.0	20.0	μA
		V <sub>DD</sub> = 3 V	-	5.0	12.0		

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

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.

All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification.

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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ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

### ► Explanation of the mark that are using it for the catalog

	► 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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