

REAL TIME CLOCK MODULE (I²C-Bus)

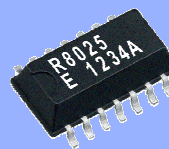
High-Stability

RX - 8025 SA / NB

- Built-in 32.768 kHz crystal unit : Frequency adjusted for high accuracy ($\pm 5 \times 10^{-6}$ / $T_a = +25^\circ\text{C}$)
- Interface Type : I²C-Bus Interface (400 kHz)
- Operating voltage range: 1.70 V to 5.5 V
- Wide Timekeeper voltage range : 1.15 V to 5.5 V
- Various detection Functions : Ex. Oscillation stop detection function
- Low backup current : 0.48 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-8025SA AA : Q41802552000100
 RX-8025SA AC : Q41802551000200
 RX-8025NB AA : Q41802592000100
 RX-8025NB AC : Q41802592000200



Actual size

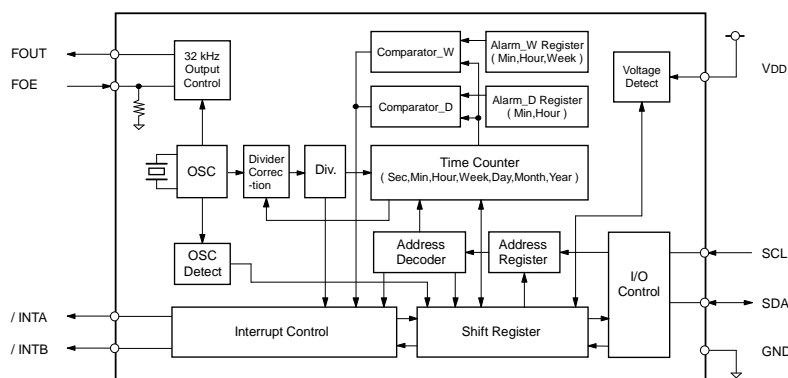
RX-8025SA



RX-8025NB



Block diagram



Overview

• Features built-in 32.768 kHz crystal unit

- Frequency adjusted for high accuracy. ($\pm 5 \times 10^{-6}$ / $T_a = +25^\circ\text{C}$) (Equivalent to 13 seconds of monthly deviation)

• The various detection function

- Power supply voltage monitoring function (with selectable detection threshold)
- Stop detection function
- Power-on reset detection function

• Alarm function and Timer function

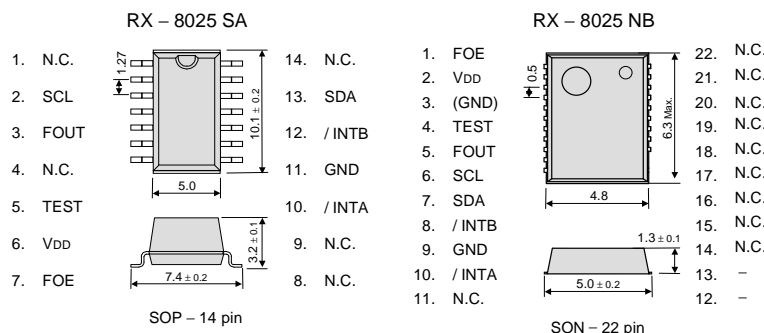
- Timer function produces a periodic interruption signal. As for the Alarm function an optional combination is produced. (Date of the week, time, minute)

Pin Function

Signal Name	Input / output	Function																					
SCL	Input	Serial clock input pin																					
SDA	Bi-directional	Data input and output pin																					
FOUT	Output	32.768 kHz clock output pin with the output control function. (C-MOS)																					
FOE	Input	<table><tr><th>FOE input</th><th>/CLEN1 bit</th><th>/CLEN2 bit</th><th>FOUT output</th></tr><tr><td>L</td><td>X</td><td>X</td><td>OFF (LOW)</td></tr><tr><td rowspan="4">H</td><td>0</td><td>0</td><td>32.768 kHz</td></tr><tr><td>0</td><td>1</td><td>32.768 kHz</td></tr><tr><td>1</td><td>0</td><td>32.768 kHz</td></tr><tr><td>1</td><td>1</td><td>OFF(LOW)</td></tr></table>	FOE input	/CLEN1 bit	/CLEN2 bit	FOUT output	L	X	X	OFF (LOW)	H	0	0	32.768 kHz	0	1	32.768 kHz	1	0	32.768 kHz	1	1	OFF(LOW)
FOE input	/CLEN1 bit	/CLEN2 bit	FOUT output																				
L	X	X	OFF (LOW)																				
H	0	0	32.768 kHz																				
	0	1	32.768 kHz																				
	1	0	32.768 kHz																				
	1	1	OFF(LOW)																				
/INTA	Output	Interrupt output A pin (N-ch open drain)																					
/INTB	Output	Interrupt output B pin (N-ch open drain)																					
TEST	—	* Used by the manufacture for testing. (Do not connect externally.)																					
VDD	—	Connected to a positive power supply.																					
GND	—	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	—	1.7	3.0	5.5	V
Clock voltage	VCLK	—	1.15	3.0	5.5	V
Operating temperature	TOPR	—	-40	+25	+85	°C

■ Frequency characteristics

Item	Symbol	Conditions	Range	Unit
Frequency tolerance	$\Delta f/f$	$T_a = +25^\circ\text{C}$ VDD = 3.0 V	AA: 5 ± 5 ^{*1)} AC: 0 ± 5 ^{*2)}	$\times 10^{-6}$
Oscillation start-up time	t _{STA}	$T_a = +25^\circ\text{C}$ VDD = 2.0 V	1 Max.	s
Frequency voltage characteristics	f / V	$T_a = +25^\circ\text{C}$ VDD = 2.0 V to 5.5 V	± 1 Max.	$\times 10^{-6}$

*1) *2) Equivalent to 13 seconds of monthly deviation (excluding offset).

■ Current consumption characteristics

 $T_a = -40^\circ\text{C}$ to $+85^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current Consumption	I _{BK}	f _{SCL} = 0Hz FOE = GND FOUT ; output OFF(LOW)	VDD = 5 V	-	0.60	1.80 μA
	I _{32k}	f _{SCL} = 0Hz VDD, FOE = 5.5 V FOUT ; output ON (Output=OPEN; CL = 0 pF)	VDD = 5.5 V	-	3.0	6.5 μA

■ Power supply detection voltage

 $T_a = -30^\circ\text{C}$ to $+70^\circ\text{C}$

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
High-voltage mode	VDETH	VDD pin	1.90	2.10	2.30	V
Low-voltage mode	VDETL	VDD pin	1.15	1.30	1.45	V

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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	► 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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