REAL TIME CLOCK MODULE (I2C-Bus)

High-Stability

RX - 8025 SA / NB

RoHS Compliant

Product Number (Please contact us)
RX-8025SA AA : Q41802552000100
RX-8025SA AC : Q41802551000200
RX-8025NB AA : Q41802592000100
RX-8025NB AC : Q41802592000200

- Built-in 32.768 kHz crystal unit : Frequency adjusted for high accuracy ($\pm 5 \times 10^{-6}$ / T_a = +25 °C)
- Interface Type : I2C-Bus Interface (400 kHz)
- Operating voltage range : 1.70 V to 5.5 V
- Wide voltage for timekeeping : 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 OE pin.
- The various functions include full calendar, Dual alarm, Periodic interruption.

* The I2C-Bus is a trademark of NXP Semiconductors

Actual size
RX-8025SA   RX-8025NB

R8025 E 1234A
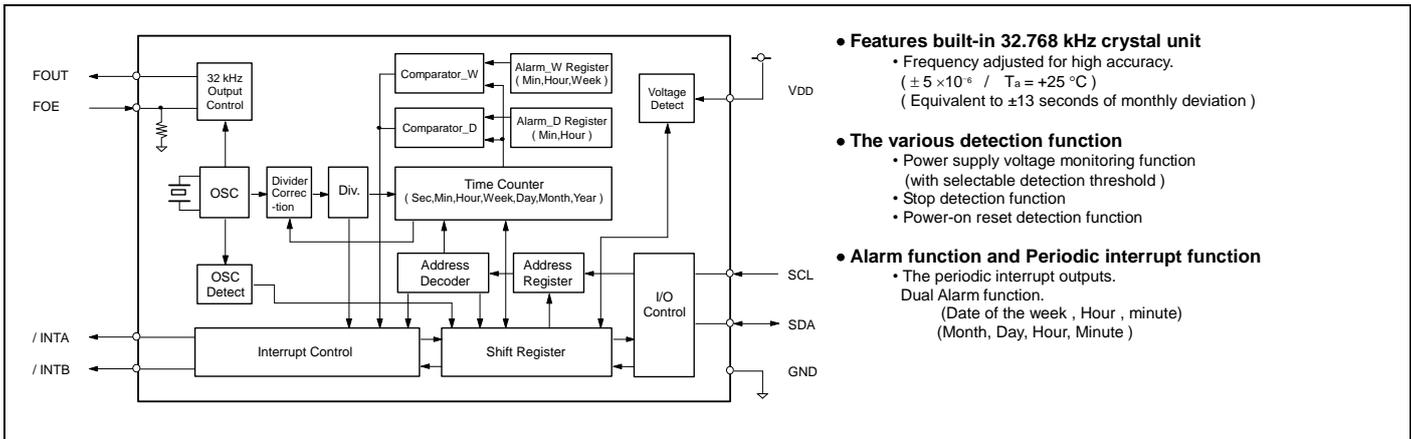
Block diagram

Overview

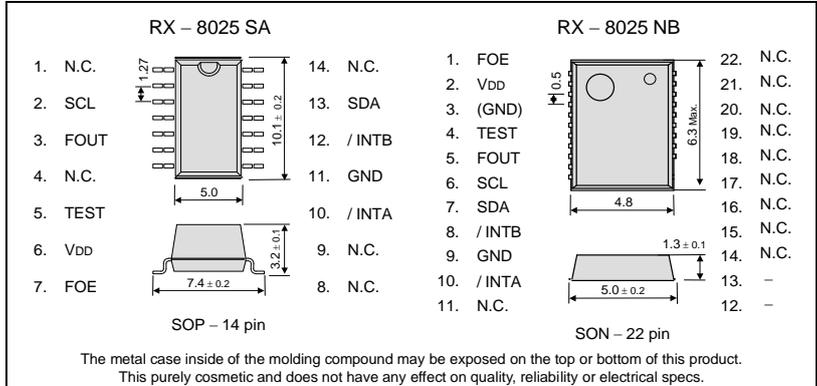- **Features built-in 32.768 kHz crystal unit**
  - Frequency adjusted for high accuracy.
    ($\pm 5 \times 10^{-6}$ / T_a = +25 °C)
    (Equivalent to ±13 seconds of monthly deviation)

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

- **Alarm function and Periodic interrupt function**
  - The periodic interrupt outputs.
    Dual Alarm function.
    (Date of the week , Hour , minute)
    (Month, Day, Hour, 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	
/ 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.)
V_DD	—	Connected to a positive power supply.
GND	—	Connected to a ground.

FOUT control 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)

Terminal connection / External dimensions   (Unit:mm)

RX – 8025 SA

1. N.C.	14. N.C.
2. SCL	13. SDA
3. FOUT	12. / INTB
4. N.C.	11. GND
5. TEST	10. / INTA
6. V_DD	9. N.C.
7. FOE	8. N.C.

1.27   10.1 ± 0.2   5.0   3.2 ± 0.1   7.4 ± 0.2

SOP – 14 pin

RX – 8025 NB

1. FOE	22. N.C.
2. V_DD	21. N.C.
3. (GND)	20. N.C.
4. TEST	19. N.C.
5. FOUT	18. N.C.
6. SCL	17. N.C.
7. SDA	16. N.C.
8. / INTB	15. N.C.
9. GND	14. N.C.
10. / INTA	13. –
11. N.C.	12. –

0.5   6.3 Max.   4.8   1.3 ± 0.1   5.0 ± 0.2

SON – 22 pin

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	—	1.7	3.0	5.5	V
Clock voltage	V_CLK	—	1.15	3.0	5.5	V
Operating temperature	T_OPR	—	-40	+25	+85	°C

■ Frequency characteristics

Item	Symbol	Conditions	Range	Unit
Frequency tolerance	$\Delta f / f$	T_a = +25 °C, V_DD = 3.0 V	AA: 5 ± 5 [*1], AC: 0 ± 5 [*2]	$\times 10^{-6}$
Oscillation start-up time	t_STA	T_a = +25 °C, V_DD = 2.0 V	1 Max.	s
Frequency voltage characteristics	f / V	T_a = +25 °C, V_DD = 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 °C to +85 °C

Item	Symbol	Conditions		Min.	Typ.	Max.	Unit
Curent Consumption	I_BK	f_SCL = 0Hz FOE = GND FOUT ; output OFF(LOW)	V_DD = 5 V	-	0.60	1.80	μA
			V_DD = 3 V	-	0.48	1.20	
	I_32k	f_SCL = 0Hz V_DD, FOE = 5.5 V FOUT ; output ON (Output=OPEN; CL = 0 pF)	V_DD = 5.5 V	-	3.0	6.5	μA

■ Power supply detection voltage T_a = -30 °C to +70 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
High-voltage mode	V_DETH	V_DD pin	1.90	2.10	2.30	V
Low-voltage mode	V_DETL	V_DD 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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For Automotive	►Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	►Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc).

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