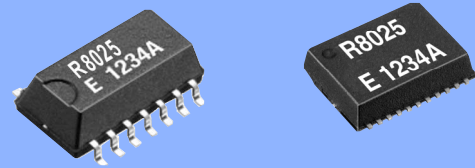


High-Stability I²C-Bus INTERFACE REAL TIME CLOCK MODULE

RX - 8025 SA / NB

- Built-in 32.768 kHz quartz oscillator : 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.
 - Lead(Pb)-free : Contains high melting temperature type solder (Pb85 %) exempted by RoHS directive.
- * The I²C-Bus is a trademark of Philips Electronics N.V.



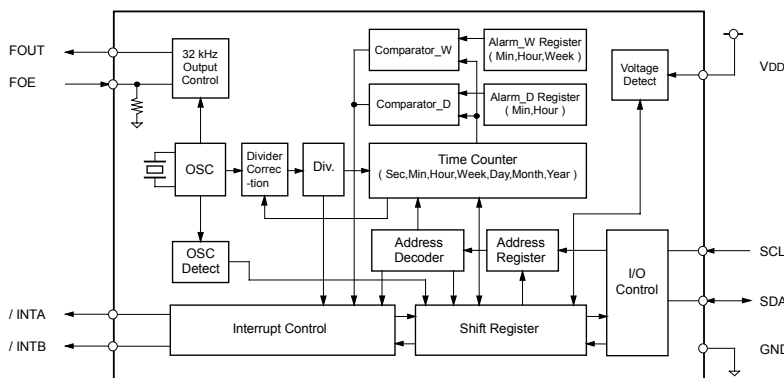
Actual size

RX-8025SA

RX-8025NB



Block diagram



Overview

• Features built-in 32.768 kHz quartz oscillator

- 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

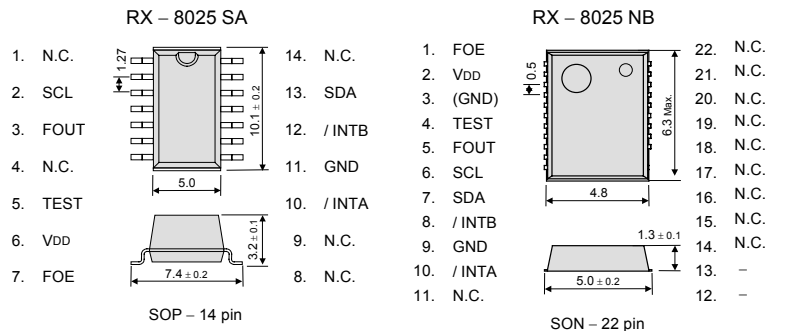
- Timer function produces a periodic interruption signal. As for the Alarm function an optional combination is produced. (Date of the week, time, minute)

Pin Function

Signal Name	Input / output	Function																					
SCL	Input	Serial clock input pin																					
SDA	Bi-directional	Data input and output pin																					
FOUT	Output	FOUT pin is 32.768 kHz clock output pin (C-MOS) that output control is possible.																					
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.)																					
V _{DD}	—	Connected to a positive power supply.																					
GND	—	Connected to a ground.																					

Terminal connection / External dimensions

(Unit:mm)



Metal may be exposed on the top or bottom of this product. This will not affect any quality, reliability or electrical spec.

Specifications (characteristics)

* Refer to application manual for details.

■ Recommended Operating Conditions

Item	Symbol	Condition	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	Condition	Range	Unit
Frequency tolerance	$\Delta f/f$	$T_a = +25^\circ\text{C}$ VDD = 3.0 V	AA: $5 \pm 5^{*1}$ AC: $0 \pm 5^{*2}$	$\times 10^{-6}$
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).

■ DC characteristics

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

Item	Symbol	Condition	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	Condition	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