For Automotive
I²C-Bus INTERFACE REAL TIME CLOCK MODULE

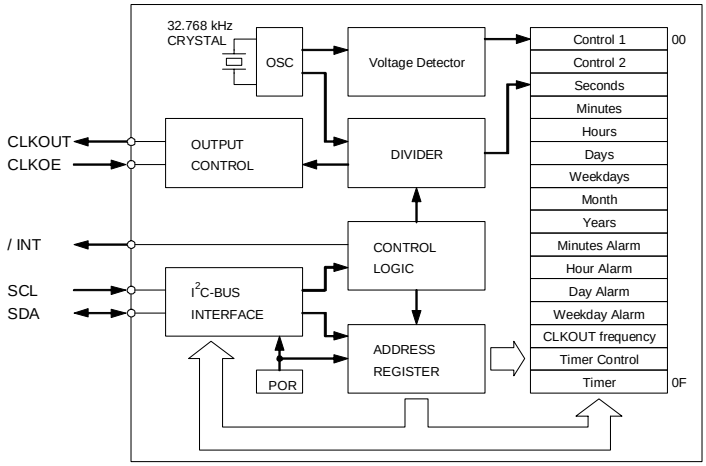
RA - 8565 SA

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : I²C-Bus Interface (400 kHz)
- Wide operating voltage range : 1.8 V to 5.5 V
- Wide Timekeeper voltage range : 1.7 V to 5.5 V
  Ta = –40 °C to +125 °C
- Extended operating temperature range: –40 °C to +125 °C
- 32.768 kHz frequency output function: N-ch Open drain output
  With Control Pin
- The various functions include full calendar, alarm, timer,etc

* The I²C-Bus is a trademark of NXP Semiconductors

Actual size

Block diagram



Overview

- Wide operating temperature range for automotive
  - –40 °C to +125 °C
- Clocking-status detection function
  - It can judge the validity of data after backup operation return by a status of VL-bit.
- 32.768kHz frequency output function
  - CLKOUT pin output (N-ch Open Drain output)
  - Output frequency can be selected as 32.768kHz, 1024Hz, 32Hz, or 1Hz.
- The various interrupt function
  - Timer function can be set up between 1/4096 second and 255 minutes.
  - Alarm function can be set to day of week, day, hour, or minute.

Pin Function

Terminal	Directions	Functions
SCL	Input	Serial clock input.
SDA	Bi-directional	Data input and output.
CLKOUT	Output	The CLKOUT pin is a clock output (open drain output) pin with control output. (Output frequency can be selected as 32.768 kHz, 1024 Hz, 32 Hz, or 1 Hz.) The CLKOE pin is an input pin used to control the output mode of the CLKOUT output pin. During the initial power-on (when power is applied from 0 V) , if the CLKOE input pin is at high level (= H) , the power-on reset function selects 32.768 kHz as the frequency.
CLKOE	Input	
/INT	Output	Interrupts output by Alarm and Timer events. (Open drain output)
VDD	–	Connected to a positive power supply.
GND	–	Connected to a ground.

Terminal connection / External dimensions

(Unit:mm)

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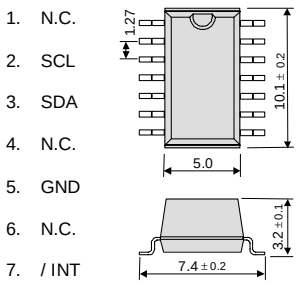

SOP - 14 pin

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	Conditions	Min.	Typ.	Max.	unit
Operating voltage	VDD	–	1.8	3.0	5.5	V
Timekeeper voltage	VCLK	–	1.7	3.0	5.5	V
Operating temperature	TOPR	–	−40	+25	+125	°C

■ Frequency characteristics

Item	Symbol	Conditions	Rating	unit
Frequency stability	Δ f / f	Ta = +25 °C VDD = 3.0 V	5 ± 23 *1	× 10 −6
Oscilation start up time	tSTA	Ta = +25 °C VDD = 1.8 V	1.5 Max.	s
		Ta = −40 °C to +125 °C VDD = 3.0 V	3 Max.	s

*1) **Equivalent to 1 minutes of monthly deviation.**

■ Current consumption under backup mode.

Item	Symbol	Conditions		Min.	Typ.	Max.	unit
Standby current.	IBK	fSCL = 0 Hz CLKOE = LOW VDD = 5 V	Ta = +125 °C		0.95	1.80	µA
			Ta = +25 °C		0.60		
		fSCL = 0 Hz CLKOE = LOW VDD = 3 V	Ta = +125 °C		0.80	1.60	µA
			Ta = +25 °C		0.55		