

**REAL TIME CLOCK MODULE (I<sup>2</sup>C-Bus)**  
**For Automotive**  
 Extended operating temperature range (+125°C)



Product Number  
**RA-8565SA : Q41A86552xxxx00**

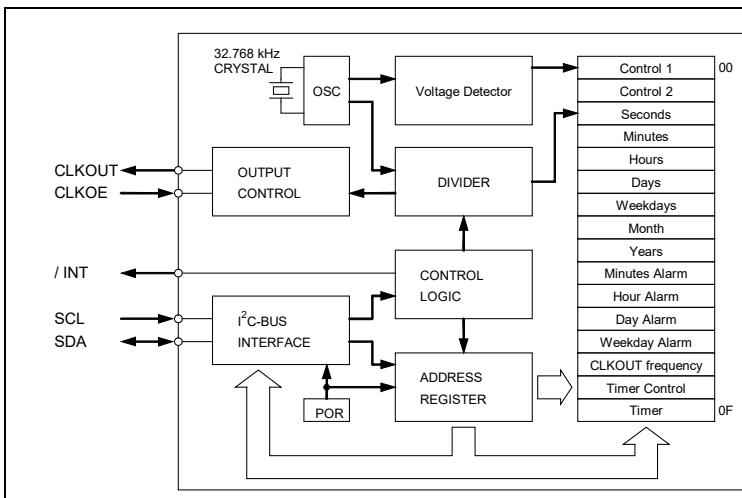
**RA-8565SA**

- Built in frequency adjusted 32.768 kHz crystal.
- Interface Type : I<sup>2</sup>C-Bus Interface (400 kHz)
- Wide operating voltage range : 1.8 V to 5.5 V
- Wide voltage for timekeeping. : 1.7 V to 5.5 V
- 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.
- Applications : Car audio, Car navigation system, Clock, ECU sub clock
- Conforms to AEC-Q200
- \* The I<sup>2</sup>C-Bus is a trademark of NXP Semiconductors



**Block diagram**

**Overview**



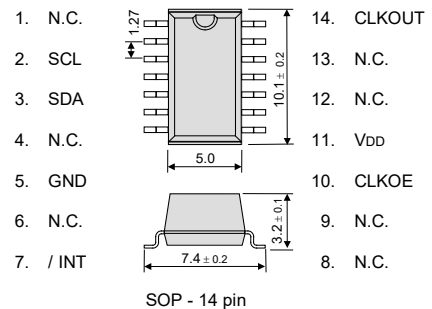
- Wide operating temperature range for automotive
  - -40 °C to +125 °C
- Clocking-status detection function
  - It can judge the validity of data after backup operation return by a status of VL-bit.
- 32.768 kHz frequency output function
  - CLKOUT pin output (N-ch Open Drain output )
  - Output frequency can be selected as 32.768 kHz, 1024 Hz, 32 Hz, or 1 Hz.
- 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 connection / External dimensions (Unit:mm)**

Signal Name	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.
CLKOE	Input	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.
/INT	Output	Interrupts output by Alarm and Timer events. ( Open drain output )
VDD	-	Connected to a positive power supply.
GND	-	Connected to a ground.

**RA - 8565 SA**



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
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	$\Delta f / f$	T <sub>a</sub> = +25 °C VDD = 3.0 V	B: 5 ± 23 *1	× 10 <sup>-6</sup>
Oscillation start up time	t <sub>STA</sub>	T <sub>a</sub> = +25 °C VDD = 1.8 V	1.5 Max.	s
		T <sub>a</sub> = -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.	I <sub>bk</sub>	f <sub>SCL</sub> = 0 Hz CLKOE = LOW	+125 °C	-	1.10	1.8	μA
		VDD = 5 V	-40 °C to +85 °C	-	0.60	1.2	
		f <sub>SCL</sub> = 0 Hz CLKOE = LOW	+125 °C	-	1.00	1.6	μA
		VDD = 3 V	-40 °C to +85 °C	-	0.55	1.0	

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	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
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