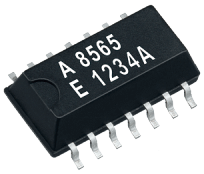
REAL TIME CLOCK MODULE (I²C-Bus)

For Automotive

Extended operating temperature range (+125°C)

Product Number
RA-8565SA : Q41A86552xxxx00

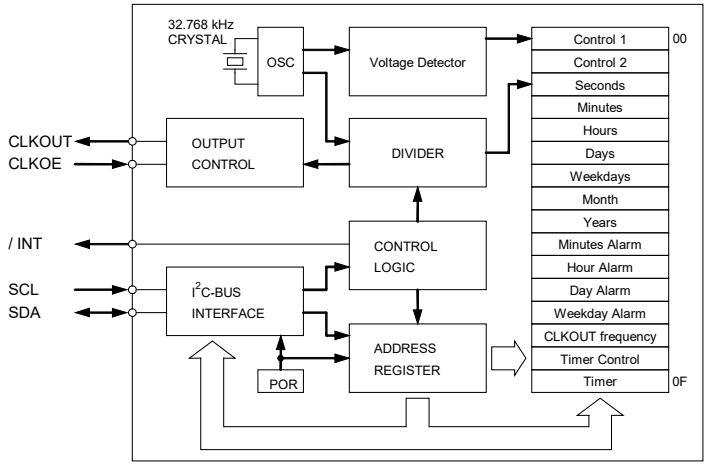
RA-8565SA



- 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 voltage for timekeeping. : 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.
- Applications : Car audio, Car navigation system, Clock, ECU sub clock
- Conforms to AEC-Q200

* The I²C-Bus is a trademark of NXP Semiconductors

Block diagram



Overview

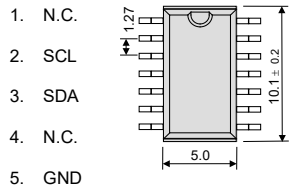
- Wide operating temperature range for automotive
  - -40 °C to +125 °C
- Clocking-status detection function
  - It can judge the validity of data after backup operation return by a status of VL-bit.
- 32.768 kHz frequency output function
  - CLKOUT pin output (N-ch Open Drain output)
  - Output frequency 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

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. 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)

RA – 8565 SA



SOP - 14 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
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	Δf / f	Ta = +25 °C VDD = 3.0 V	B: 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	+125 °C	-	1.10	1.8	µA
			-40 °C to +85 °C	-	0.60	1.2	
		fSCL = 0 Hz CLKOE = LOW VDD = 3 V	+125 °C	-	1.00	1.6	µA
			-40 °C to +85 °C	-	0.55	1.0	

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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs, Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired IATF 16949 certification that is requested strongly by major automotive manufacturers as standard.

IATF 16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

►Explanation of the mark that are using it for the catalog

Pb Free	►Pb free.
RoHS Compliant	►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.)
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).