

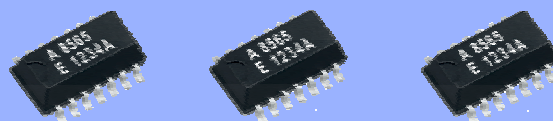
For Automotive
I²C-Bus INTERFACE REAL TIME CLOCK MODULE



RA - 8565 SA

- Built in frequency adjusted 32.768 kHz crystal.
- 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
 $T_a = -40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$
- Extended operating temperature range: $-40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$
- 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 Philips Electronics N.V.

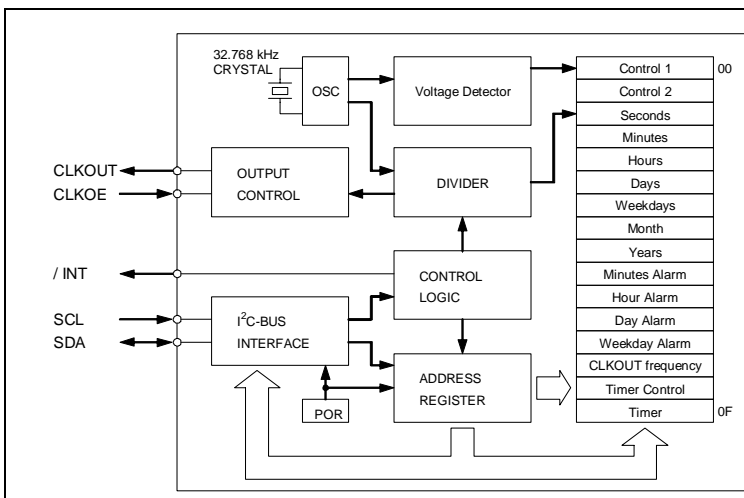


Actual size



Block diagram

Overview

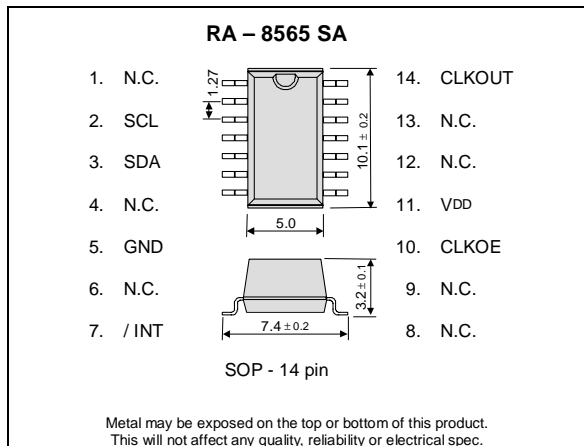


- Wide operating temperature range
 - $-40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$
- Clocking-status detection function
 - It can judge the validity of data after backup operation return by a status of VL-bit.
- 32.768kHz frequency output function
 - CLKOUT pin output (N-ch Open Drain output)
 - 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 connection / External dimensions (Unit:mm)

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.
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.



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	$\Delta f / f$	$T_a = +25\text{ }^\circ\text{C}$ VDD = 3.0 V	$5 \pm 23^{*1}$	$\times 10^{-6}$
Oscillation start up time	tSTA	$T_a = +25\text{ }^\circ\text{C}$ VDD = 1.8 V	2 Max.	s
		$T_a = -40\text{ }^\circ\text{C to }+125\text{ }^\circ\text{C}$ 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	$T_a = +125\text{ }^\circ\text{C}$	0.95	1.80	μA
		$T_a = +25\text{ }^\circ\text{C}$	0.60			
		fSCL = 0 Hz CLKOE = LOW VDD = 3 V	$T_a = +125\text{ }^\circ\text{C}$	0.80	1.60	μA
		$T_a = +25\text{ }^\circ\text{C}$	0.50			

“3D STRATEGY” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, “Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.

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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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QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from the automobile industry.

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