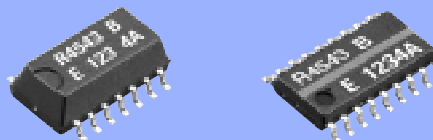




**Simple Function**  
**SERIAL-INTERFACE REAL TIME CLOCK MODULE**

**RTC - 4543 SA/SB**

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface type : Serial-interface
- Operating voltage range : 2.5 V to 5.5 V
- Wide Timekeeper voltage range : 1.4 V to 5.5 V
- 32.768 kHz frequency output function : C-MOS output With Control Pin
- The various functions include full calendar, timer, and low voltage detection.



Actual size

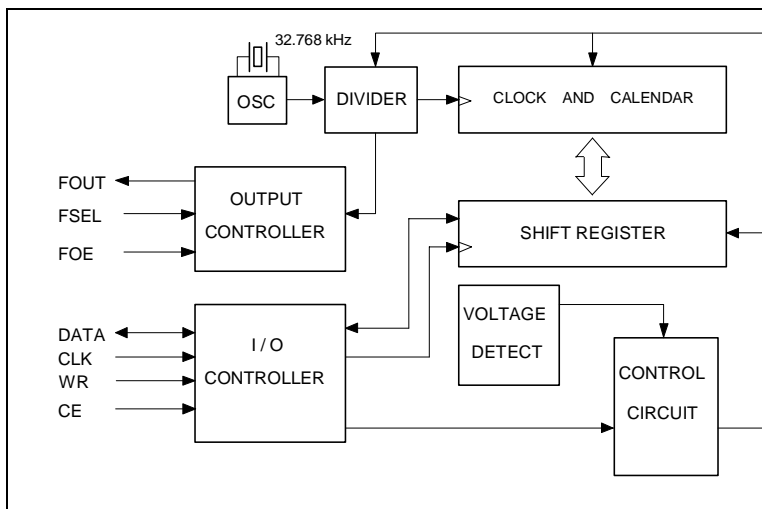
RTC-4543SA

RTC-4543SB



**Block diagram**

**Overview**



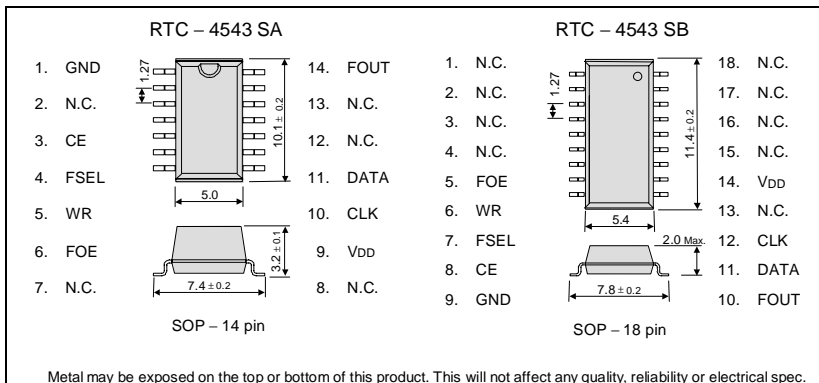
- **32.768 kHz frequency output function**
  - FOUT pin output (C-MOS output), CL=30 pF
  - FOE pin enables output on/off control.
  - FSEL pin enables output selectable 32.768 kHz or 1Hz.
- **Power supply voltage monitoring function**
  - Detection that power supply voltage descended to 1.7 V or less.
  - Automatic record to FDT-bit at the time of power supply decline detection.

**Pin Function**

**Terminal connection / External dimensions**

(Unit:mm)

Signal Name	Input / Output	Function
CE	Input	The chip enabled input pin. At the HIGH level, access becomes possible.
CLK	Input	The shift clock input pin for serial data transfer.
WR	Input	DATA pin input / output switching pin.
DATA	Bi-directional	The data input / output pin for serial data transfer.
FOUT	Output	32.768 kHz or 1Hz clock output pin (C-MOS output). High impedance at output off.
FOE	Input	The input pin for the FOUT output control.
FSEL	Input	Select the frequency that is output from the FOUT pin.
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	Condition	Min.	Typ.	Max.	Unit
Power voltage	VDD	—	2.5	5.0	5.5	V
Clock voltage	VCLK	—	1.4	5.0	5.5	V
Operating temperature	TOPR	—	-40	+25	+85	°C

**Frequency characteristics**

Item	Symbol	Condition	Rating	Unit
Frequency tolerance	$\Delta f / f$	Ta = +25 °C VDD = 5.0 V	5 ± 23 *	× 10 <sup>-6</sup>
Oscillation start-up time	tSTA	Ta = +25 °C VDD = 2.5 V	3 Max.	s

\* Please ask for tighter tolerance.(Equivalent to 1 minute of monthly deviation )

**DC characteristics**

Ta = -40 °C to +85 °C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Current Consumption	IBK	CE = GND FOE = GND FOUT ;output OFF (Hi-z)	VDD = 5 V	1.5	3.0	μA
			VDD = 3 V	1.0	2.0	
			VDD = 2 V	0.5	1.0	

**Supply Voltage Detection Characteristic**

Ta = -40 °C to +85 °C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Power supply detection voltage	VDT	VDD pin	1.4	1.7	2.0	V

# “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.

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, 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. In the future, new group companies will be expected to acquire the certification around the third year of operations.

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

Epson Toyocom quickly began working to acquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification for all targeted products manufactured in Japanese and overseas plants.

Epson Toyocom has acquired QS-9000 certification, which is of a higher level. Also, TS 16949 certification, which is also of a higher level, has been acquired.

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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  - / Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
  - / traffic control equipment / and others requiring equivalent reliability.
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