

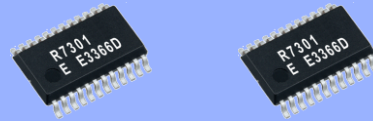
REAL TIME CLOCK MODULE (4-bit)

RTC-7301SF

- Built-in crystal unit 32.768 kHz with frequency adjusted
- High speed parallel interface compatible with SRAM
- Built-in alarm and timer interrupt functions.
- Built-in semiconductor temperature sensor (Voltage output: -7.8 mV / °C)
- Frequency selectable clock output (32.768 kHz to 1/30 Hz)
- Built-in 30 second adjustment function, digital pace adjustment function (Max. adjustment:  $\pm 192 \times 10^{-6}$ )
- Operating voltage range: 2.4 V to 5.5 V, time keeping voltage range: 1.6 V to 5.5 V
- Low current consumption (0.6  $\mu$ A / 3 V Typ.)



Product Number (Please contact us)  
RTC-7301SF : Q42730181000200

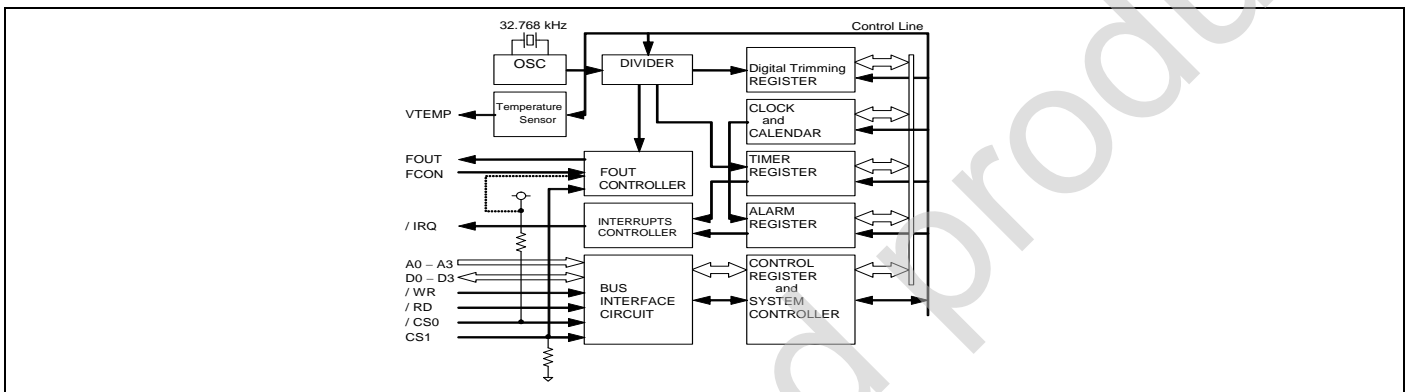


Actual size

RTC-7301SF



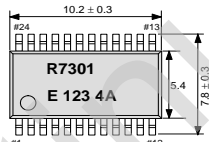
Block diagram



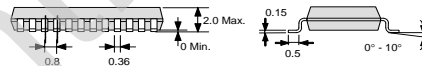
External dimensions/Terminal connection

(Unit:mm)

RTC-7301SF (SSOP 24-pin)



No.	Pin terminal	No.	Pin terminal
1	/CS0	24	VDD
2	FCOIN	23	(VDD)
3	FOUT	22	(VDD)
4	VTEMP	21	(VDD)
5	(VDD)	20	(VDD)
6	/IRQ	19	(VDD)
7	A0	18	CS1
8	A1	17	D0
9	A2	16	D1
10	A3	15	D2
11	/RD	14	D3
12	GND	13	/WR



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.

Absolute Max. rating

GND=0 V

Item	Symbol	Conditions	Min.	Max.	Unit
Supply voltage	VDD	VDD to GND	-0.3	+7.0	
Input voltage	VIN	Input terminal, D0 to D3 pins	GND-0.3	VDD+0.3	V
Output voltage(1)	VOUT1	/IRQ pin		+8.0	
Output voltage(2)	VOUT2	FOUT, D0-D3, VTEMP pin		VDD+0.3	
Storage temperature	TSTG	Stored as bare product.	-55	+125	°C

DC characteristics

(GND=0 V, VDD=1.6 V to 5.5 V, Ta=-40 °C to +85 °C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption (When non-accessed) FOUT =Output OFF VTEMP=Output OFF	I <sub>DD1</sub>	/CS0, /RD, /WR=VDD A0-A3, CS1=GND D0-D3, /IRQ=Hi-Z		1.0	2.0	$\mu$ A
	I <sub>DD2</sub>	FOUT=Hi-Z(OFF) VTEMP=Hi-Z(OFF)		0.6	1.0	

Operating range

GND = 0 V

Item	Symbol	Conditions	Min.	Max.	Unit
Power voltage	VDD	—	2.4	5.5	V
Clock voltage	VCLK	—	1.6	5.5	
Operating temperature	TOPR	No condensation	-40	+85	°C

Temperature sensor characteristics

GND=0 V, Ta=-40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Temperature output voltage	VTEMP	Ta=+25 °C, GND based output voltage VTEMP pins, VDD=2.7 V to 5.5 V	-	1.470	-	V
Output precision	T <sub>ACR</sub>	Ta=+25 °C, VDD=2.7 V to 5.5 V	-	-	±5.0	°C
Temperature sensitivity	VSE	-40 °C ≤ Ta ≤ +85 °C, VDD=2.7 V to 5.5 V	-7.3	-7.8	-8.3	mV / °C
Linearity	ΔNL	-40 °C ≤ Ta ≤ +85 °C, VDD=2.7 V to 5.5 V	-	-	±2.0	%
Temperature detection range	T <sub>SOP</sub>	ΔNL ≤ ±2.0 %, VDD=2.7 V to 5.5 V	-40	-	+85	°C
Output resistance	R <sub>0</sub>	Ta=25 °C, VTEMP pins, VDD=2.7 V to 5.5 V GND standard and VDD standard	-	1.0	3.0	kΩ
Load condition	CL	VDD=2.7 V to 5.5 V	-	-	100	pF
	RL	VDD=2.7 V to 5.5 V	500	-	-	kΩ
Response time	t <sub>RSP</sub>	VDD=3.3 V CL=50 pF, RL=500 kΩ, Max. ±1 °C	-	-	200	μs

Frequency characteristics

Item	Symbol	Conditions	Range	Unit
Frequency precision	Δf / f	Ta=+25 °C, VDD=3.0 V	B: 5±23 (*1)	×10 <sup>-6</sup>
Oscillation Start up time	t <sub>STA</sub>	Ta=+25 °C, VDD=2.4 V	3.0 Max.	s
Frequency temperature characteristics	T <sub>OP</sub>	Ta=-10 °C to +70 °C VDD=3.0 V, +25 °C	+10 / -120	×10 <sup>-6</sup>
Frequency voltage characteristics	f/V	Ta=+25 °C, VDD=1.6 V to 5.5 V	±2.0 Max.	×10 <sup>-6</sup> /V
Aging	fa	Ta=+25 °C, VDD=3.0 V First year	±5.0 Max.	×10 <sup>-6</sup> /year

(\*1) Please ask tighter tolerance

## 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.





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ISO/TS16949 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.
	► 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.)
	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).

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