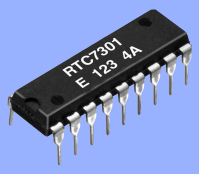
REAL TIME CLOCK MODULE (4-bit)

RTC-7301SF/DG

- 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, only RTC-7301SF)
- Frequency selectable clock output (32.768 kHz to 1/30 Hz)
- Built-in 30 second adjustment function, digital pace adjustment function (Max. adjustment: ±192 × 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 µA / 3 V Typ.)

RoHS Compliant

Product Number (Please contact us)
RTC-7301SF : Q42730181000200
RTC-7301DG : Q42730111000200

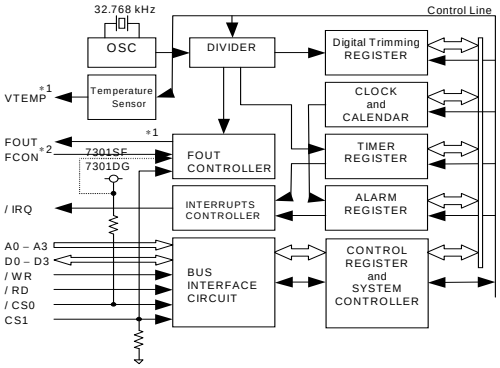


Actual size

RTC-7301SF

RTC-7301DG

Block diagram



This is a block diagram for RTC-7301SF.

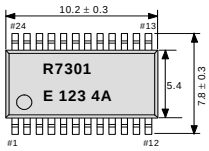
Be aware that RTC-7301DG differs according to the following 2 points.

∗1) The VTEMP output is not connected to an external pin.
∗2) The FCON input pin is not connected to an external pin, FCON is fixed at "H" internally.

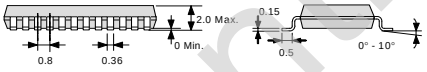
External dimensions/Terminal connection

(Unit:mm)

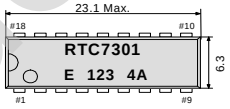
● RTC-7301SF (SSOP 24-pin)



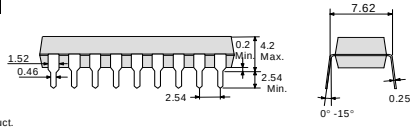
No.	Pin terminal	No.	Pin terminal
1	/CS0	24	VDD
2	FCON	23	(VDD)
3	FOUT	22	(VDD)
4	VTEMP	21	(VDD)
5	(VDD)	20	(VDD)
6	/IRQ	19	(VDD)
7	A0	18	CS1
8	A1	17	D0
9	A2	16	D1
10	A3	15	D2
11	/RD	14	D3
12	GND	13	/WR



● RTC-7301DG (DIP 18-pin)



No.	Pin terminal	No.	Pin terminal
1	/CS0	18	VDD
2	FOUT	17	(VDD)
3	/IRQ	16	(VDD)
4	A0	15	CS1
5	A1	14	D0
6	A2	13	D1
7	A3	12	D2
8	/RD	11	D3
9	GND	10	/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	V
Input voltage	VIN	Input terminal, D0 to D3 pins	GND-0.3	VDD+0.3	
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

■Operating range

GND = 0 V

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

■Frequency characteristics

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

(*1) Please ask tighter tolerance

■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	IDD1	/CS0,/RD,/WR=VDD A0-A3,CS1=GND D0-D3,/IRQ=Hi-z FOUT=Hi-z(OFF) VTEMP=Hi-z(OFF)	VDD=5 V	—	1.0	2.0	µA
	IDD2		VDD=3 V	—	0.6	1.0	

Note)There is no VTEMP pin on the RTC-7301DG so standards for the VTEMP pin within the conditions described above do not apply.

■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	TACR	Ta=+25 °C,V DD=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	TSOP	ΔNL≤ ±2.0 %,VDD=2.7 V to 5.5 V	-40	-	+85	°C
Output resistance	R0	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	tRSP	VDD=3.3 V CL=50 pF, RL=500 kΩ, Max. ±1 ℃	-	-	200	µs

Note)There is no temperature sensor function on the RTC-7301DG.

Discontinued product

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 ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

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	►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).

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Discontinued product