

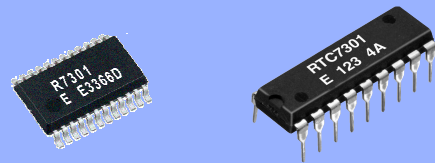
REAL TIME CLOCK MODULE (4-bit)

RTC-7301SF / DG

- Built-in crystal unit 32.768 kHz with frequency adjusted
- Frequency selectable clock output (32.768 kHz to 1/30 Hz)
- Built-in 30 second adjustment function, digital pace adjustment function (Max. adjustment: $\pm 192 \times 10^{-6}$)
- Built-in alarm and timer interrupt functions.
- Built-in semiconductor temperature sensor (Voltage output: -7.8 mV / °C, RTC-7301SF)
- 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 μ A / 3 V Typ.)
- High speed parallel interface compatible with SRAM



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



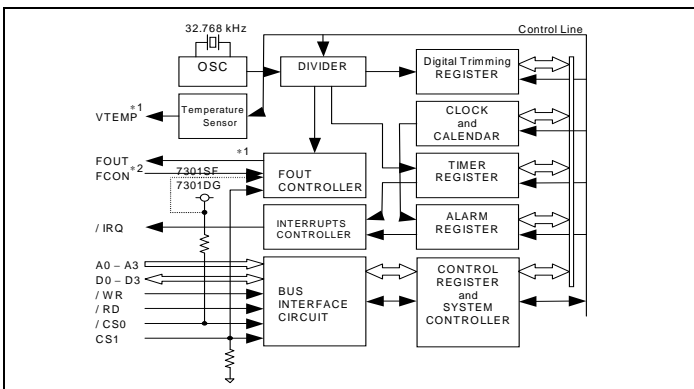
Actual size

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, but 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

Specifications (characteristics)

*Refer to application manual for details.

■ Absolute Max. rating (GND=0 V)

Item	Symbol	Conditions	Min.	Max.	Unit
Supply voltage	V _{DD}	V _{DD} to GND	-0.3	+7.0	
Input voltage	V _{IN}	Input terminal, D ₀ to D ₃ pins	GND-0.3	V _{DD} +0.3	V
Output voltage(1)	V _{OUT1}	/IRQ pin		+8.0	
Output voltage(2)	V _{OUT2}	FOUT, D ₀ -D ₃ , VTEMP pin		V _{DD} +0.3	
Storage temperature	T _{STG}	Stored as bare product.	-55	+125	°C

■ DC characteristics (GND=0 V, V_{DD}=1.6 V to 5.5 V, T_a=-40 °C to +85 °C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption (When non-accessed) FOUT =Output OFF VTEMP=Output OFF	I _{DD1}	/CS ₀ , /RD, /WR=V _{DD} A ₀ -A ₃ , CS ₁ =GND D ₀ -D ₃ , /IRQ=Hi-z		1.0	2.0	μ A
	I _{DD2}	FOUT=Hi-z(OFF) VTEMP=Hi-z(OFF)		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.

■ Operating range (GND = 0 V)

Item	Symbol	Conditions	Min.	Max.	Unit
Power voltage	V _{DD}	—	2.4	5.5	V
Clock voltage	V _{CLK}	—	1.6	5.5	
Operating temperature	T _{OPR}	No condensation	-40	+85	°C

■ Temperature sensor characteristics (GND=0 V, T_a=-40 °C to +85 °C)

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

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

■ Frequency characteristics

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

(*)1 Please ask tighter tolerance

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