



Built-in Temperature Sensor SERIAL-INTERFACE REAL TIME CLOCK MODULE

RTC - 4701 JE / NB

- Built in frequency adjusted 32.768 kHz crystal unit.
- Interface Type : 3-wire serial interface
- Operating voltage range : 1.6 V to 5.5 V
- Wide Timekeeper voltage range : 1.6 V to 5.5 V
- Built-in temperature sensor : Detects temperature.
Converts output to analog voltage
- 32.768 kHz frequency output function : C-MOS output With Control Pin
- Function of time and calendar, the various interrupt function etc.



Product Number (Please contact us)
RTC-4701JE : Q41470171000200
RTC-4701NB : Q41470192000200



Actual size

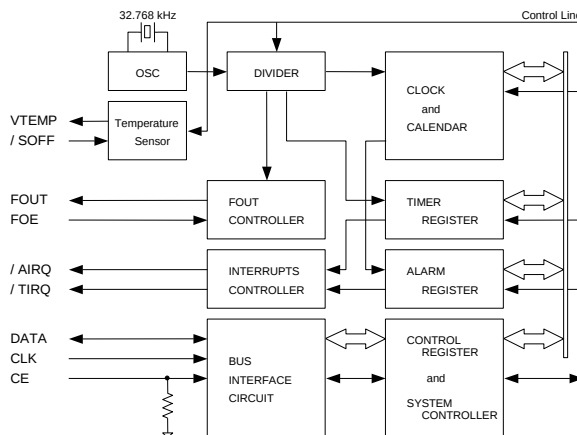
RTC-4701JE



RTC-4701NB



Block diagram



Overview

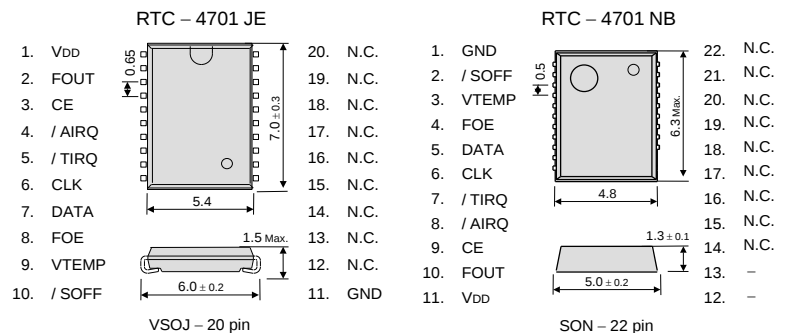
- **Built-in temperature sensor**
 - Diode temperature sensor (analog voltage output)
 - * temperature sensor operating voltage : 2.7 V to 5.5 V
 - * temperature sensor tolerance : $\pm 5^\circ\text{C}$ ($T_a = +25^\circ\text{C}$)
 - * voltage output (analog): $-7.6\text{ mV}/^\circ\text{C}$ Typ.
- **32.768 kHz frequency output function**
 - FOUT pin output (C-MOS output), CL=30 pF
 - FOE pin enables output on/off control.
- **The various interrupt function**
 - 12 bit additional counter. (to 4095 count)
 - Timer function can be set up between 1/4096 second and 255 minutes.
 - Alarm function can be set to day of week, hour, or minute.

Pin Function

Signal Name	Input / Output	Function										
CE	Input	The chip enabled input pin. (Built -in pull-down resistance)										
CLK	Input	The shift clock input pin for serial data transfer.										
DATA	Bi-directional	The data input / output pin for serial data transfer.										
FOUT	Output	<table><tr><td>FOE input</td><td colspan="2">FOUT output</td></tr><tr><td>HIGH</td><td>32.768 kHz output</td><td>* C-MOS output</td></tr><tr><td>LOW</td><td>output OFF</td><td>* Hi - z</td></tr></table>		FOE input	FOUT output		HIGH	32.768 kHz output	* C-MOS output	LOW	output OFF	* Hi - z
FOE input	FOUT output											
HIGH	32.768 kHz output	* C-MOS output										
LOW	output OFF	* Hi - z										
FOE	Input											
VTEMP	Output	The voltage output pin for the temperature sensor (analog).										
/SOFF	Input	The input pin for the temperature sensor control.										
/AIRQ	Output	Output 1 pin (N-ch open drain)										
/TIRQ	Output	Output 2 pin (N-ch open drain)										
VDD	—	Connected to a positive power supply.										
GND	—	Connected to a ground.										

Terminal connection / External dimensions

(Unit:mm)



Metal may be exposed on the top or bottom of this product. This will not affect any quality, reliability or electrical spec.

Temperature sensor characteristics

* Refer to application manual for details.

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Temperature output voltage	VTEMP	VTEMP pin, $T_a = +25^\circ\text{C}$ GND based output voltage		1.480		V
Output tolerance	TACR	$T_a = +25^\circ\text{C}$			± 5.0	$^\circ\text{C}$
Temperature sensitivity	VSE	$-40^\circ\text{C} \leq T_a \leq +85^\circ\text{C}$	-7.1	-7.6	-8.1	mV/ $^\circ\text{C}$
Linearity	ΔNL	$-40^\circ\text{C} \leq T_a \leq +85^\circ\text{C}$			± 2.0	%
Temperature detection range	TSOP	$\Delta\text{NL} \leq \pm 2.0\%$	-40		+85	$^\circ\text{C}$
Output resistance	Ro	VTEMP pin, $T_a = +25^\circ\text{C}$ GND standard and VDD standard		1.0	3.0	k Ω

* Temperature sensitivity $VSE = (V(+85^\circ\text{C}) - V(-40^\circ\text{C})) / 125 [\text{mV}/^\circ\text{C}]$

* Linearity $\Delta\text{NL} = \frac{a}{b} \times 100 [\%]$
 a: Maximum deviation between the measured value of VTEMP and approximate straight line.
 b: Difference between the measured values at -40°C and $+85^\circ\text{C}$.

* Output resistance (Ro) $Ro = \frac{\Delta V}{\Delta I} [\Omega]$ 