

# REAL TIME CLOCK MODULE (I<sup>2</sup>C-Bus)

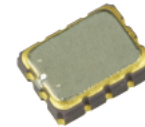
Built-in backup battery charge control function



Product Number (2,000 pcs / Reel)  
RX8130CE: X1B000311000100

## RX8130CE

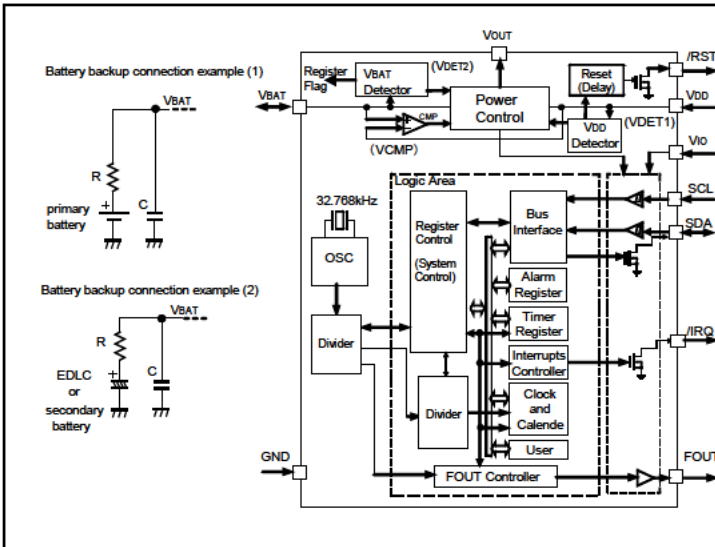
- Built-in frequency adjusted 32.768 kHz crystal unit
  - Interface Type : I<sup>2</sup>C-Bus
  - Low backup current : 300 nA Typ. / 3 V
  - Auto power switching function : Automatically switches to backup power supply by monitoring the V<sub>DD</sub> voltage
  - Backup battery charge control function : For the rechargeable battery
  - Reset functions with a delay : Detect a main power supply and remove the reset
  - Interrupt output : Wake up every minute or every second
  - Alarm interruption : Day, date, hour, minute, second
  - Auto repeat wakeup timer interruption
  - Self-monitoring interruption : Crystal oscillation stop, V<sub>BAT</sub> LOW, V<sub>DD</sub> LOW
- The I<sup>2</sup>C-Bus is a trademark of NXP Semiconductors



RX8130CE  
( 3.2 x 2.5 mm, t = 1.0 mm Max. )

### Block diagram

### Overview

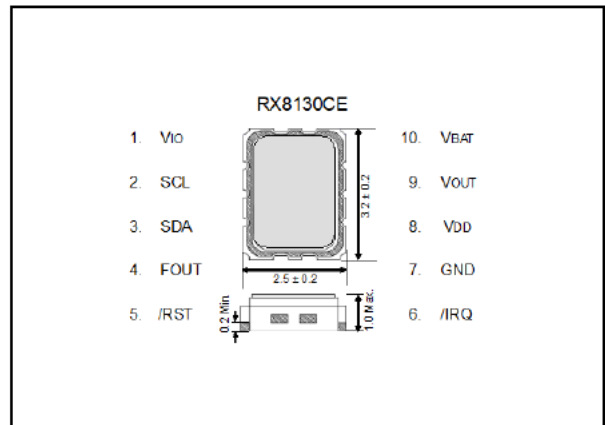


- Interface type  
I<sup>2</sup>C-Bus interface Fast-Mode 400 kHz
- Auto power switch function  
The V<sub>DD</sub> voltage is monitored and it switches to the backup power supply by the automatic operation  
Backup power supply switching voltage 1.2V Min.
- Clock output function  
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
- Wakeup timer function  
Selectable from 244 μs to 7.5 years (16 bit x 1 ch.)  
Timer source clock selectable from 1/3600 Hz, 1/60 Hz, 1 Hz, 64 Hz, 4096 Hz. Auto release after interrupt output from /IRQ pin at timer completes  
This operation is auto repeat with a selected cycle, it can be used like a watchdog timer
- Backup battery charge control function  
Stop charging automatically by detecting the full charge.  
Records in the register detecting the backup power supply Voltage decrease
- Reset function with a delay  
When the main power is supplied, reset output is released.  
The reset/release voltage is selected by the register (2 types)  
Delay time of release from backup mode is 60ms Min.

### Pin Functin

### Terminal connection / External dimensions (Unit: mm)

Signal Name	I / O	Function
SCL	Input	Serial clock input pin
SDA	Input / Output	Serial data input and output pin
FOUT	Output	Frequency output pin (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz)
/RST	Output	Reset output pin (N-ch. open drain) In case of V <sub>DD</sub> voltage drop detection, a reset signal is outputted In case of V <sub>DD</sub> voltage rise detection, a released reset signal is outputted
/IRQ	Output	Interrupts output by Alarm and Timer events (N-ch. open drain)
V <sub>DD</sub>	-	Power-supply pin Possible to supply different voltage from V <sub>IO</sub>
V <sub>IO</sub>	-	Interface power supply pin Input to supply the voltage same as a host
V <sub>OUT</sub>	-	Internal voltage output pin Connect bypass capacitor of 1.0 μF
V <sub>BAT</sub>	-	This is a power supply pin for backup battery Connect an EDLC, a secondary battery, a primary battery In the backup voltage range, supplied to IC, from this pin
GND	-	Ground pin



### Specifications (characteristics)

\* Refer to application manual for details

#### Recommended Operating Conditions

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating supply voltage	V <sub>DD</sub>	-	1.25	3.0	5.5	V
Clock supply voltage	V <sub>CLK</sub>	-	1.1	3.0	5.5	V
Operating temperature	T <sub>a</sub>	-	-40	+25	+85	C
V <sub>DD</sub> detect voltage	-V <sub>DET2</sub>	V <sub>DD</sub> , Fall	1.20	1.30	1.40	V

#### Frequency characteristics

Item	Symbol	Condition	Rating	Unit
Frequency tolerance	Δ f / f	T <sub>a</sub> = +25 °C V <sub>DD</sub> = 3.0 V	B: 5 ± 23	x 10 <sup>-6</sup>
Oscillation start-up time	t <sub>STA</sub>	V <sub>DD</sub> = 2.75 V to 5.5 V	1 Max.	s

#### Current consumption characteristics

T<sub>a</sub> = -40 °C to +85 °C

tem	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption	I <sub>BAT</sub>	SCL = SDA = "L", V <sub>BAT</sub> = 3.0 V, V <sub>DD</sub> = V <sub>IO</sub> = 0.0 V	-	300	500	nA
	I <sub>32k</sub>	SCL = SDA = "H", FOUT = 32.768 kHz, / RQ=OFF, V <sub>DD</sub> = V <sub>IO</sub> = 3.0 V, FOUT pin CL = 15 pF, CHGEN = L or V <sub>BAT</sub> ≥ V <sub>DET3</sub>	-	3.5	4.0	μA

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