

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

Build in backup battery charge control function

## RX8130CE

- Built in frequency adjusted 32.768 kHz crystal unit
- Interface Type : I<sup>2</sup>C -Bus
- Interface voltage range : 1.6 V ~ 5.5 V
- Wide voltage for timekeeping : 1.1 V ~ 5.5 V
- Low backup current : 300 nA (Typ.) / 3 V
- Auto power switching function : Switchover by main power supply monitor.
- Backup battery charge control function : For the rechargeable lithium batteries.
- Reset functions with a delay : Detect a main power supply and remove the reset.
- The various function include full calendar, alarm, timer, etc.

The I<sup>2</sup>C-Bus is a trademark of NXP Semiconductors.

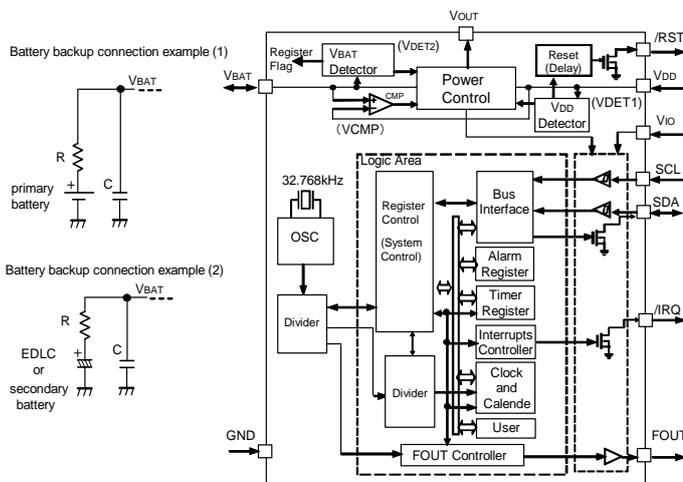


Product Number (Please contact us)  
RX8130CE : X1B000311000100



Actual size

### Block diagram



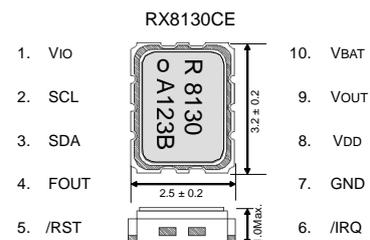
### Overview

- I<sup>2</sup>C-Bus interface.
- Auto power switching function
  - The VDD voltage is monitored and it switches to the backup power supply by the automatic operation.
  - The switch voltage to the backup power supply, 1.25V (Min.)
  - Even if the main power supply voltage is decreased, the current flow from the backup power supply is prevented.
- Charge control function for the rechargeable lithium batteries.
  - 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 release voltage is selected by the register. (2.80V / 2.75V)
  - Delay time from the voltage rise detection is 60ms Typ.
- Frequency output function
  - Output frequency is selectable from 32.768kHz, 1024Hz, 1Hz.
- Timer function
  - Selectable in 1/4096 second from 65535 hours.
  - Timer source clock are 1hour, 1min, 64Hz, 4096Hz.
  - It is automatically recorded to TF-bit at the time of event occurrence, and possible to output with /IRQ pin.

### Pin Functin

Signal Name	I / O	Function
SCL	Input	Serial clock input pin.
SDA	Input / Output	Data input and output pin.
FOUT	Output	Frequency output pin with output control function. (C-MOS) Output frequency can be selected as 32.768kHz, 1024Hz, 1Hz.
/RST	Output	Reset output pin.(N-ch open drain) In case of VDD voltage drop detection, a reset signal is outputted. In case of VDD voltage rise detection, it is released reset signal after 60ms.
/IRQ	Output	Interrupts output by Alarm and Timer events.(N-ch open drain)
VDD	-	This is a power-supply pin. It can impress the voltage unlike VIO.
VIO	-	This is a interface power supply pin. This is a pin to supply the voltage same as a host.
VOUT	-	Internal voltage output pin. Connect smoothing capacitor of 1.0μF
VBAT	-	This is a power supply pin for backup battery. This is a pin to connect a large-capacity capacitor, a secondary battery, a primary battery. In a backup power supply operating range, the voltage is supplied inside by this pin.
GND	-	Connected to a ground.

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



### Specifications (characteristics)

\* Refer to application manual for details.

#### Recommended Operating Conditions

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating supply voltage	VDD	-	1.25	3.0	5.5	V
Clock supply voltage	VCLK	-	1.1	3.0	5.5	V
Operating temperature	TOPR	-	-40	+25	+85	°C
VDD detect voltage	-VDET2	VDD, Fall	1.20	1.30	1.40	V

#### Frequency characteristics

Item	Symbol	Condition	Rating	Unit
Frequency tolerance	Δ f / f	Ta = +25 °C VDD = 3.0 V	B : 5 ± 23*	× 10 <sup>-6</sup>
Oscillation start-up time	tSTA	VDD = 2.75 V ~ 5.5 V	1 Max.	s

\* Equivalent to 1 minute of monthly deviation (excluding offset).

#### Current consumption characteristics

Ta = -40 °C ~ +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption	IBK	SCL=SDA = "L", VBAT=3.0V, VDD=VIO=0.0V	-	300	500	nA
	I32k	SCL=SDA = "H", FOUT=32.768kHz, /IRQ=OFF, VDD=VIO=3.0V, FOUT pin CL=15pF CHGEN=L or VBAT ≥ VDET3	-	3.5	4.0	μA

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	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
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