REAL TIME CLOCK MODULE (I^2C-Bus)

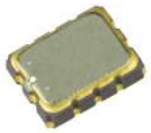
Built-in backup battery charge control function

Pb Free
RoHS Compliant

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

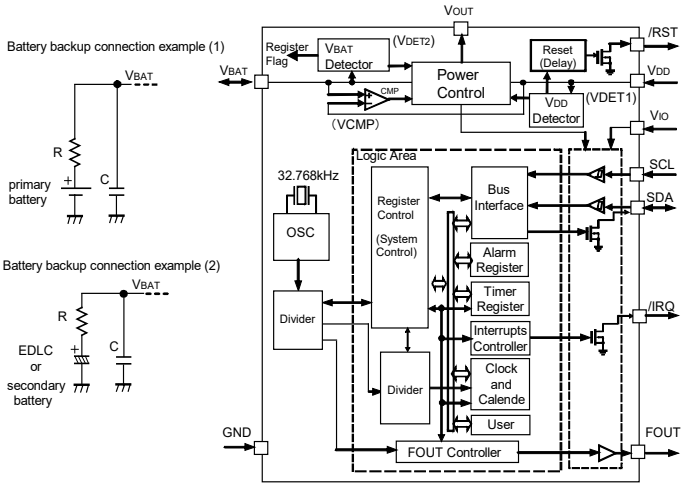
RX8130CE

- Built-in frequency adjusted 32.768 kHz crystal unit
- Interface Type : I^2C-Bus
- Low backup current : 300 nA Typ. / 3 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the V_{DD} 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_{BAT} low, V_{DD} low



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

Block diagram



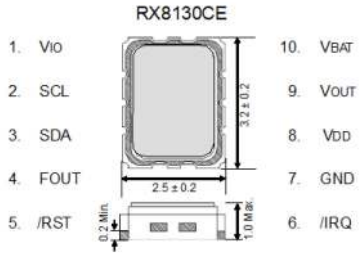
Overview

- Interface type
  I^2C-Bus interface Fast-Mode 400 kHz
- Auto power switch function
  The V_{DD} 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

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_{DD} voltage drop detection, a reset signal is outputted In case of V_{DD} voltage rise detection, a released reset signal is outputted
/IRQ	Output	Interrupts output by Alarm and Timer events (N-ch. open drain)
V_{DD}	–	Power-supply pin Possible to supply different voltage from V_{IO}
V_{IO}	–	Interface power supply pin Input to supply the voltage same as a host
V_{OUT}	–	Internal voltage output pin Connect bypass capacitor of 1.0 µF
V_{BAT}	–	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

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	V_{DD}	–	1.25	3.0	5.5	V
Clock supply voltage	V_{CLK}	–	1.1	3.0	5.5	V
Operating temperature	Ta	–	-40	+25	+85	°C
V_{DD} detect voltage	$-V_{DET2}$	V_{DD}, Fall	1.20	1.30	1.40	V

■ Frequency characteristics

Item	Symbol	Condition	Rating	Unit
Frequency tolerance	Δ f / f	Ta = +25 °C V_{DD} = 3.0 V	B: 5 ± 23	x 10^{-6}
Oscillation start-up time	tSTA	V_{DD} = 2.75 V to 5.5 V	1 Max.	s

■ Current consumption characteristics

Ta = -40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption	I_{BAT}	SCL = SDA = "L", V_{BAT} = 3.0 V, V_{DD} = V_{IO} = 0.0 V	-	300	500	nA
	I_{32k}	SCL = SDA = "H", FOUT = 32.768 kHz, /IRQ=OFF, V_{DD} = V_{IO} = 3.0 V, FOUT pin CL = 15 pF, CHGEN = L or V_{BAT} ≧ VDET3	-	3.5	4.0	µA

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