

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

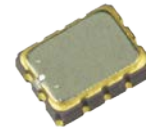
Time stamp function and Low current consumption



Product Number (2,000 pcs / Reel)  
**RX8111CE A : X1B000421000115**  
**RX8111CE B : X1B000421000215**

## RX8111CE

- Built in frequency adjusted 32.768 kHz crystal unit
- Interface Type : I<sup>2</sup>C -Bus
- Low backup current : 100 nA Typ. / 3 V
- Auto power switching function : Automatically switches to backup power supply by monitoring the V<sub>DD</sub> voltage
- Time stamp function : 8 times stamped from year to 1/256 seconds
- 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

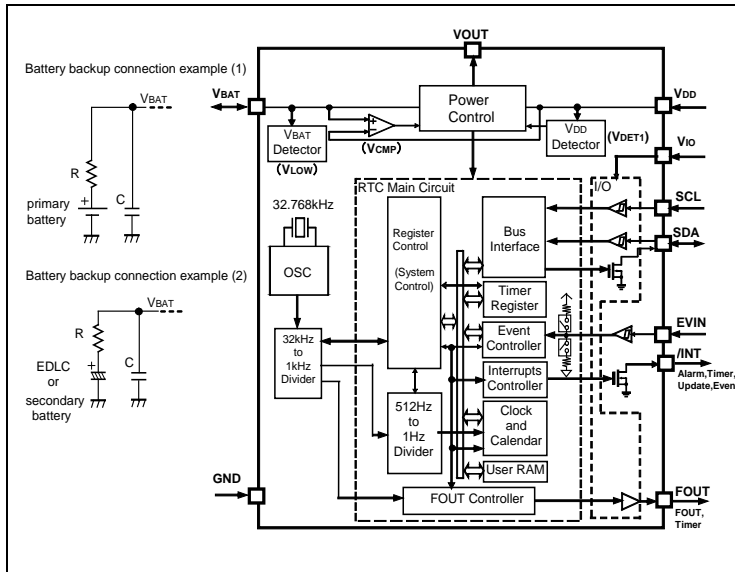


**RX8111CE**

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

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

### Block diagram



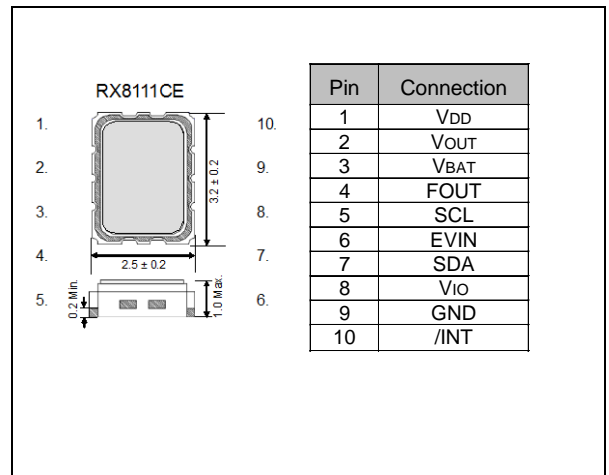
### Overview

- 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 1.2 V Min.
- Clock output function  
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz  
When the clock output is not used, the FOUT pin can be used as a timer output pin (CMOS)
- Wakeup timer function  
Selectable from 244  $\mu$ s to 32 years (24 bit x 1 ch.)  
Timer source clock selectable from 1/60 Hz, 1 Hz, 64 Hz, 4096 Hz  
Auto release after interrupt output from /INT pin at timer completes  
This operation is auto repeat with a selected cycle, it can be used like a watchdog timer
- Time stamp function  
8 times stamped from year to 1/256 seconds  
The time stamp trigger inputs from EVIN pin, self-monitoring and I<sup>2</sup>C software command  
EVIN pin has function of chattering-cancel
- Alarm function  
It is possible program from year to second
- Self-monitoring interruption  
Crystal oscillation stop, V<sub>BAT</sub> low, V<sub>DD</sub> low

### Pin Functin

Signal Name	I / O	Function
EVIN	Input	External event input pin (Pull up/down and polarity are selectable by software)
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)
/INT	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 $\mu$ F
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

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



### Specifications (characteristics)

\* Refer to application manual for details

#### ■ Recommended Operating Conditions

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operating supply voltage	V <sub>DD</sub>	-	1.6	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>DET1</sub>	V <sub>DD</sub> , Fall	1.20	1.40	1.60	V

#### ■ Frequency characteristics

Item	Grade	Symbol	Conditions	Min.	Typ.	Max.	Unit
Frequency tolerance	A	$\Delta f / f$	T <sub>a</sub> = +25 °C V <sub>DD</sub> = 3.0 V	-11.5	-	+11.5	x 10 <sup>-6</sup>
	B			-23	-	+23	
Oscillation start-up time		t <sub>STA</sub>	V <sub>DD</sub> = 2.75 V to 5.5 V	-	0.3	1.0	s

#### ■ Current consumption characteristics

T<sub>a</sub> = -40 °C to +85 °C

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Current consumption	I <sub>BAT</sub>	SCL = SDA = "L", FOUT = OFF, /INT = OFF, V <sub>BAT</sub> = 3.0 V, V <sub>DD</sub> = V <sub>IO</sub> = 0.0 V, CHGEN = 0b, INIEN = 0b, SWSEL0 = 1, SWSEL1 = 0	-	100	450	nA
	I <sub>32k</sub>	FOUT = 32.768 kHz, /INT = OFF, V <sub>DD</sub> = V <sub>IO</sub> = 3.0 V, FOUT pin CL = 15 pF	-	2.0	3.0	$\mu$ A

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