

REAL TIME CLOCK MODULE (SPI-Bus)

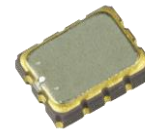
Time stamp function and Low current consumption



Product Number (2,000 pcs / Reel)
RX4111CE (A grade): X1B000431000115
RX4111CE (B grade): X1B000431000215

RX4111CE

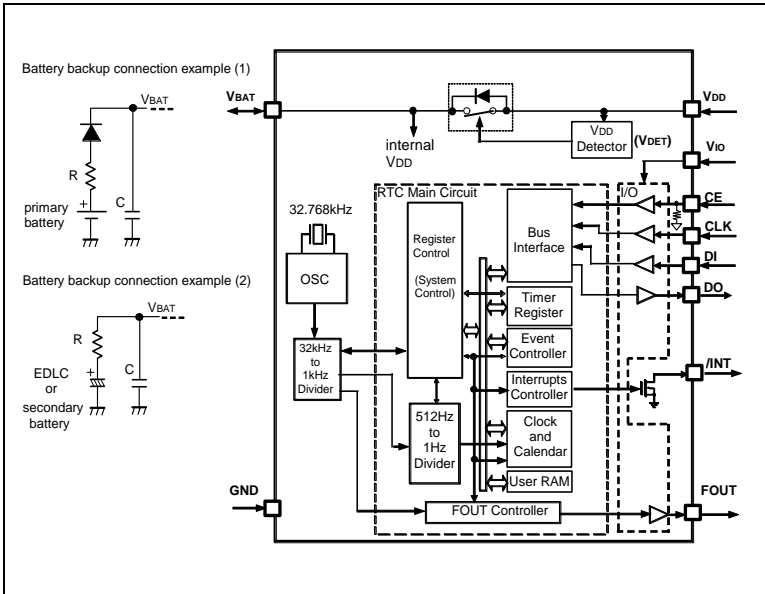
- Built in frequency adjusted 32.768 kHz crystal unit
- Operating Temperature : -40 °C to +105 °C
- Interface Type : SPI -Bus 4 wire
- Low backup current : 100 nA Typ. / 3 V
- Auto power switching function: Automatically switches to backup power supply by monitoring the VDD voltage.
- Time stamp function : 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_{BAT} low, V_{DD} low



RX4111CE
 (3.2 x 2.5 mm , t = 1.0 mm Max.)

Block diagram

Overview

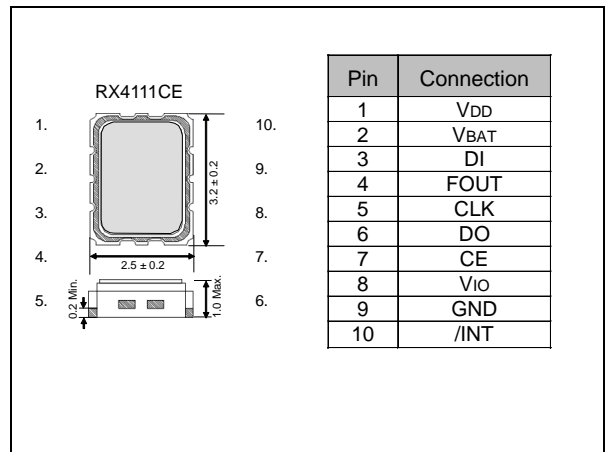


- Interface type
SPI-Bus interface (4 wire, 1 MHz)
- Auto power switch function
The V_{DD} voltage is monitored and it switches to the backup power supply by the automatic operation
Backup power supply switching voltage 1.2V Min.
- Clock output function
Output frequency is selectable from 32.768 kHz, 1024 Hz, 1 Hz
- Wakeup timer function
Selectable from 244 μs to 32 years (24 bit 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 self-monitoring and SPI command
- Alarm function
It is possible program from year to second
- Self-monitoring interruption
Crystal oscillation stop, V_{BAT} low, V_{DD} low

Pin Functin

Terminal connection / External dimensions (Unit: mm)

Signal Name	I / O	Function
CE	Input	Chip enables input pin
CLK	Input	Serial clock input pin
DI	Input	Data input pin
DO	Output	Data output pin
FOUT	Output	Frequency output (CMOS) (frequency selection: 32.768 kHz, 1024 Hz, 1 Hz)
/INT	Open-Drain Output	Interrupts output by Alarm and Timer events. (N-ch. open drain)
VDD	-	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 _{BAT}	-	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	Conditions	Min.	Typ.	Max.	Unit
Operating supply voltage	V _{DD}	-	1.6	3.0	5.5	V
Clock supply voltage	V _{CLK}	-	1.1	3.0	5.5	V
Operating temperature	T _a	-	-40	+25	+105	°C
VDD detect voltage	-V _{DET1}	V _{DD} , Fall	1.20	1.40	1.60	V

Frequency characteristics

Item	Grade	Symbol	Conditions	Min.	Typ.	Max.	Unit
Frequency tolerance	A	Δf/f	T _a = +25 °C V _{DD} = 3.0 V	-11.5	-	+11.5	× 10 ⁻⁶
	B			-23	-	+23	
Oscillation start-up time		t _{STA}	V _{DD} = 2.75 V to 5.5 V	-	0.3	1.0	s

Current consumption characteristics T_a = -40 °C to +105 °C

Symbol	Conditions	T _a (°C)	Typ.	Max.	Unit
I _{DD}	Input pins = "L", FOUT = OFF, /INT = OFF, V _{DD} = V _{IO} = 3.0 V, CHGEN = 0b, INIEN = 0b,	-40 ~ 85	100	450	nA
		-40 ~ 105	100	1000	
I _{32k}	Input pins = "L", FOUT = 32.768 kHz, /INT = OFF, V _{DD} = V _{IO} = 3.0 V, FOUT pin CL = 15 pF, CHGEN = 0b, INIEN = 1b	-40 ~ 85	2.0	3.0	μA
		-40 ~ 105	2.0	3.5	

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