XT32H05x

XT32 microcontroller RTC

Application notes

Rev 0.0.0

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Revised :

Revision History

Release	Date	Author	Summary of Change
V0.0.0	28/09/2023	Shirling Liu	Initial

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1 Introduce

This application note serves as a comprehensive guide for software developers, offering essential information on RTC. It covers fundamental concepts and provides guidelines to ensure proper utilization of RTC in software development projects. Whether you're a beginner or an experienced developer, this document will equip you with the necessary knowledge and best practices to effectively configure and utilize RTC in your applications.

1.1 Required peripherals

This application involves modules as table 1.

Table 1. Modules in example

Sub-module	Peripheral use	Note
RTC	count-up counter	
UART	Only use to print rtc calendar information	for detail usage, please refer to document XT32H0xxB--uart-AN23030A.

1.2 Compatible devices

This example is compatible with the devices in Table 2.

Table 2. Device list

Product	EVB
XT32H050	XB002823

2 Design description

2.1 Feature overview

RTC implement count-up counter. When counter reach the maximum value, it wraps to 0 and then continues incrementing.

2.2 Design steps

1. Set RTC source and reference clock divider by AON.
2. Configure RTC parameters.
3. Set the initial date and time information for calendar.
4. Read and print the current date and time information.

2.3 Design considerations

2.4 Software flowchart

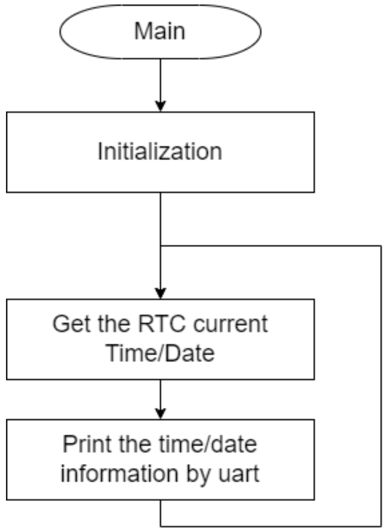
Main
Initialization
Get the RTC current Time/Date
Print the time/date information by uart

Figure 1. Application flow

2.5 Reference code

In this example, set 32kHz LSE is set as the RTC clock source, and the clock is divided by 32768 to obtain a 1s timing.

```
    /** Initializes the peripherals clocks
    */
    __HAL_RCC_SET_LS_SOURCE(RCC_LSSRC_LSE);
    __HAL_RCC_SET_RTC_REFCLK_DIV(32768);
```

Configure Peripheral RTC using HAL_RTC_Init.

```
    /* -1- Configure RTC clock source and divider in
SystemClock_Config() */
    LL_RCC_RTCResetRelease();  //release RTC reset
    /* -2-* Initialize RTC */
    hrtc.Instance = RTC;
    hrtc.Init.HourFormat = RTC_HOURFORMAT_24;
    if (HAL_RTC_Init(&hrtc) != HAL_OK)
    {
        Error_Handle();
    }
```

XT_Rtc_Task read and print current date and time information.

```
void XT_Rtc_Task(void)
{
    /* USER CODE */

    /* Get the RTC current Time */
    HAL_RTC_GetTime(&hrtc, &sTime/*, RTC_FORMAT_BIN*/);
    /* Get the RTC current Date */
    HAL_RTC_GetDate(&hrtc, &sDate/*, RTC_FORMAT_BIN*/);

    /* Display time Format : hh:mm:ss */
    DBG_printf("%02d-%2d-%02d(%02d)", sDate.Year +
YEAR_SINCE,  sDate.Month+1, sDate.Date,sDate.WeekDay);
    DBG_printf("  %02d:%02d:%02d  \n", sTime.Hours, sTime.Minutes,
sTime.Seconds);
    HAL_Delay(100);
}
```

2.6 Additional resources

- XT32H0xxB--reference manual
- XT32H0xxB--uart-AN23030A