EC2x&EG9x&EG25-G Series
QuecOpen RTC Alarm Clock Application Note

LTE Standard Module Series

Rev. EC2x&EG9x&EG25-G_Series_QuecOpen_RTC_Alarm_Clock_Application_Note_V1.0

Date: 2020-07-24

Status: Released

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About the Document

Revision History

Version	Date	Author	Description
1.0	2020-07-24	Gale GAO/ Young XU	Initial

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1 Introduction

Quectel LTE Standard EC2x&EG9x&EG25-G series modules support QuecOpen® solutions. A built-in RTC (Real Time Clock) device is provided in these modules. You can implement the alarm clock and alarm clock wake-up functions based on the RTC device, and can also use it as a normal timer. This document mainly guides you how to use the RTC alarm clock and its wake-up functions of these modules quickly and easily.

1.1. Applicable Modules

Table 1: Applicable Modules

Module Series	Module
EC2x series	EC25 series
	EC21 series
	EC20 R2.1
EG9x series	EG95 series
	EG91 series
EG25-G	EG25-G

2 RTC Hardware Circuit Reference Design

2.1. RTC Hardware Circuit Reference Design

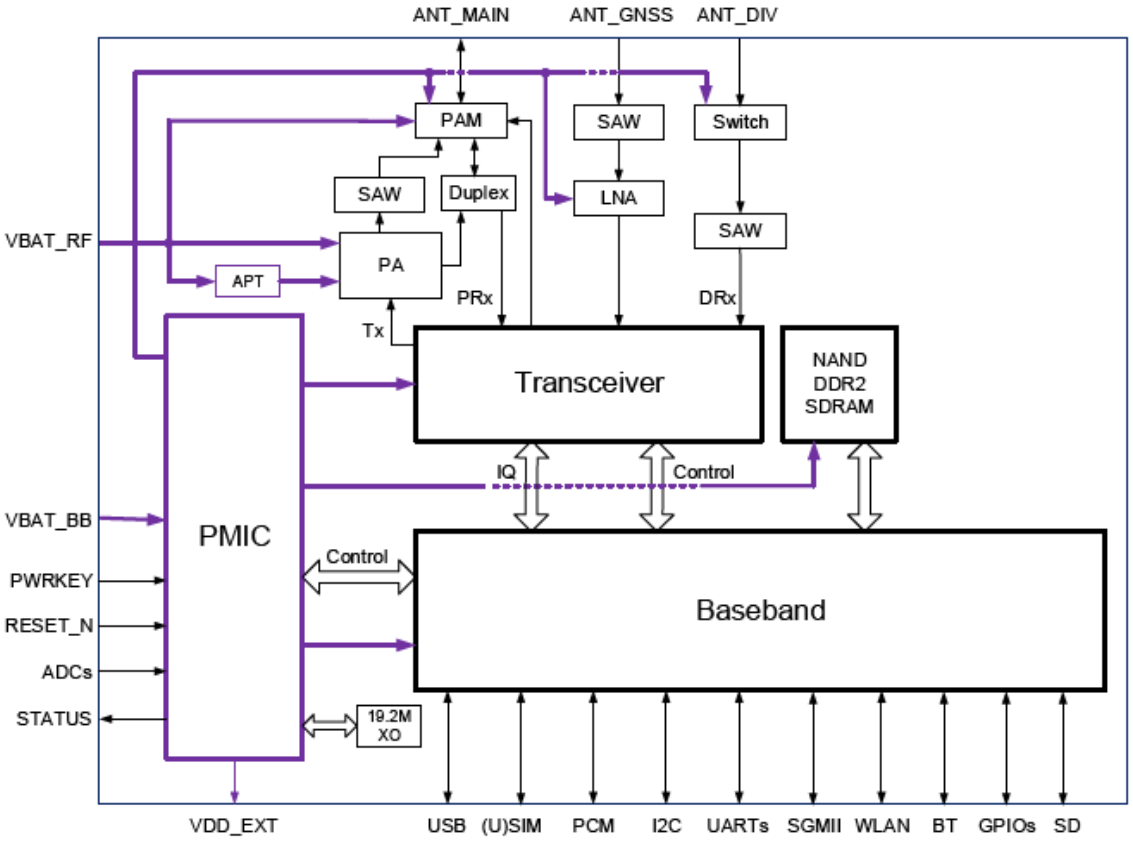

Figure 1: RTC Hardware Circuit Reference Design (Take EC21/EC25 Series Module as an Example)

Quectel EC2x&EG9x&EG25-G series QuecOpen modules' embedded PMIC has a built-in hardware RTC device, but there is no dedicated power supply control pin for it. The RTC is powered by the VBAT_BB pin shown in the above figure, so you must ensure that VBAT_BB can be powered normally when it is off.

3 Set System Time

The background process ql_time_daemon in EC2x&EG9x&EG25-G series QuecOpen modules will automatically synchronize the system time and maintain the module's hardware RTC. If you need to manually modify the system time, it can be achieved by writing the time information with the writing format **user: UTC time** (unit: millisecond) into the file */tmp/ql_time_set_pipe*. For example, if the system time needs to be set to 20180101 01:01:10, write the time information into the file with the following command.

```
echo “user: 1514768470000” > /tmp/ql_time_set_pipe
```

See ***document [7]*** for details.

4 RTC Alarm Clock Function

4.1. RTC Alarm Clock Instruction

Modify the time by referring to the routine *example_timer.c* in the path *ql-ol-sdk/ql-ol-extsdk/example/posix_timer/* in the SDK package according to the specific needs.

4.2. Function Test

1. Decompress the SDK package, enter the folder *ql-ol-sdk* and compile the routine with the following command.

```
$ source ql-ol-crosstool/ql-ol-crosstool-env-init
$ cd ql-ol-extsdk/example/posix_timer/
$ make clean
$ make
```

2. An executable program named example_timer under the path ql-ol-sdk/ql-ol-extsdk/example/posix_timer in the SDK package is generated. The generated executable program can be pushed to the module file system through the following adb commands.

```
$ adb push example_timer /data/
$ adb shell chmod a+x /data/example_timer
```

3. Enter the Linux shell terminal and execute the following command to execute the routine.

```
$ cd /data/
$ ./example_timer &
```

4. The module will print log to Linux terminals after about 100s later.

5 RTC Alarm Clock Wake-up Function

5.1. RTC Alarm Clock Wake-up Instruction

Modify the time by referring to the routine *example_suspend_alarm.c* in the path *ql-ol-sdk/ql-ol-extsdk/example/posix_timer/* in the SDK package according to the specific needs.

5.2. Function Test

1. Decompress the SDK package, enter the folder *ql-ol-sdk* and compile the routine with the following command.

```
$ source ql-ol-crosstool/ql-ol-crosstool-env-init
$ cd ql-ol-extsdk/example/posix_timer/
$ make clean
$ make
```

2. An executable program named example_suspend_alarm under the path ql-ol-sdk/ql-ol-extsdk/example/posix_timer in the SDK package is generated. The generated executable program can be pushed to the module file system through the following adb commands.

```
$ adb push example_suspend_alarm /data/
$ adb shell chmod a+x /data/ example_suspend_alarm
```

3. Enter the Linux shell terminal and execute the following command to execute the routine.

```
$ cd /data/
$ ./ example_suspend_alarm &
```

4. In Linux terminal, use command **echo mem> /sys/power/autosleep** to configure the module to enter automatic sleep. At this time, the Linux terminal cannot perform data interaction. After that, the system will be woken up every 5 seconds, and the Linux terminal can perform data interaction.

6 Appendix A References

Table 2: Related Documents

SN	Document Name	Remark
[1]	Quectel_EC21_QuecOpen_Hardware_Design	EC21 QuecOpen Hardware Design
[2]	Quectel_EC25_QuecOpen_Hardware_Design	EC25 QuecOpen Hardware Design
[3]	Quectel_EC20_R2.1_QuecOpen_Hardware_Design	EC20 R2.1 QuecOpen Hardware Design
[4]	Quectel_EG91_QuecOpen_Hardware_Design	EG91 QuecOpen Hardware Design
[5]	Quectel_EG95_QuecOpen_Hardware_Design	EG95 QuecOpen Hardware Design
[6]	Quectel_EG25-G_QuecOpen_Hardware_Design	EG25-G QuecOpen Hardware Design
[7]	Quectel_EC2x_QuecOpen_Linux_System_Time_User_Guide	EC2x QuecOpen Linux System Time User Guide

Table 3: Terms and Abbreviations

Abbreviation	Description
PMIC	Power Management IC
RTC	Real Time Clock
SDK	Software Development Kit