RT-THREAD W60X SDK Description

RT-THREAD Document Center

WWW.RT-THREAD.ORG

Thursday 12th September, 2019

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1 Introduction

The RT-Thread W60X SDK consists of a detailed introduction to the development platform W601 IoT Board and rich software resources.

With the rise of the Internet of Things (IoT), new development needs are constantly emerging, and more and more devices require networking capabilities. Traditional development methods are no longer sufficient to meet these increasingly diverse needs. To improve development efficiency, more common components are needed. Therefore, the W60X SDK not only explains how to use development board resources, but also introduces common components in RT-Thread and a rich set of software packages for IoT applications. These packages will greatly facilitate developers during the development process.

2 Introduction to W601 IoT Board Development Board Resources

2.1 Hardware Resource Description

The W601 IoT Board development board is shown in the figure below:

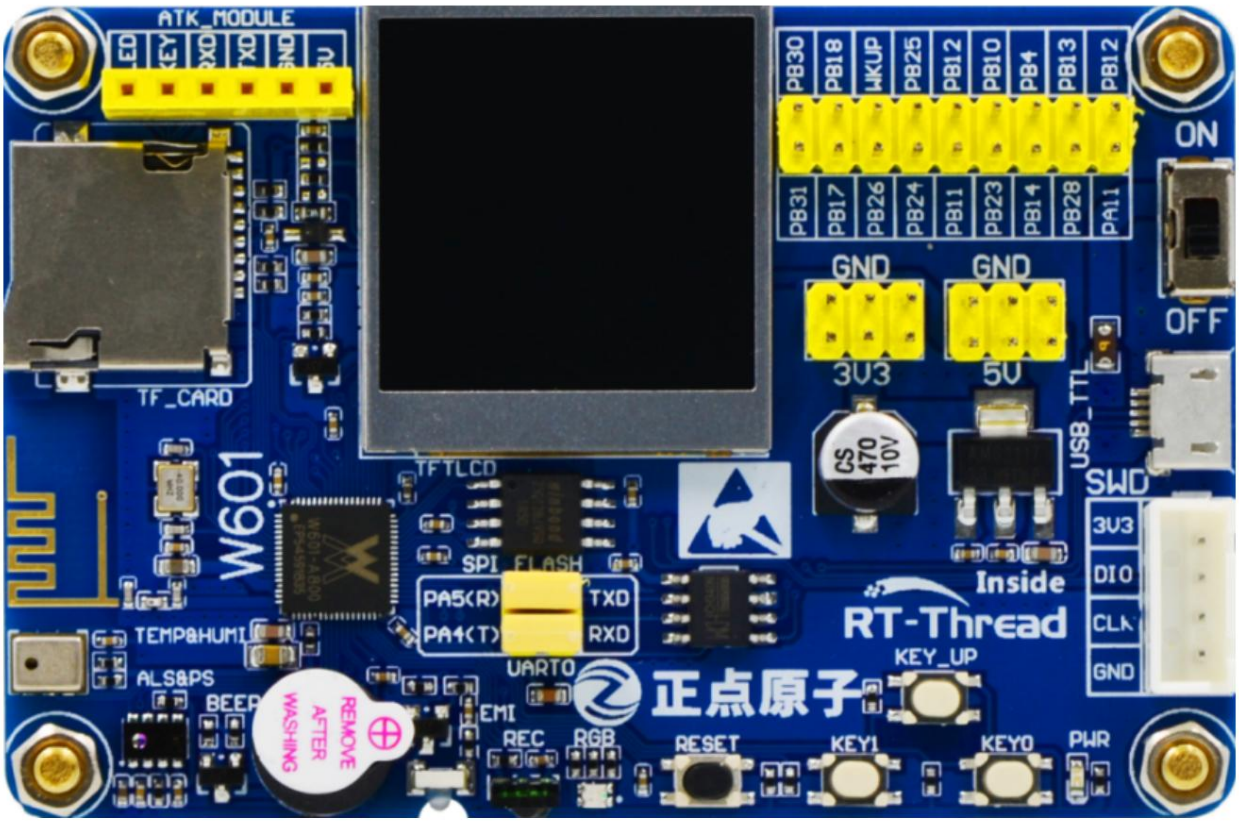

Figure 1: *W601 IoT Board* Development Board

The core chip resources of the development board are as follows:

Supports multi-interface, multi-protocol wireless LAN IEEE802.11n (1T1R). Integrated Cortex-M3 core, main frequency 80Mhz. Built-in 1MB Flash and 288KByte SRAM. Integrated with an RF transceiver front-end, CMOS PA, and baseband processor/media access control. Supports SDIO, SPI, UART, GPIO, I²C, PWM, I²S, 7816, and other interfaces, as well as multiple encryption and decryption protocols such as PRNG, SHA1, MD5, RC4, DES, 3DES, AES, CRC, and RSA.

2.2 Software Resource Description

In this section, we will introduce the software resources of W60X SDK. W60X SDK will provide a wealth of examples for you to use. Each example has Corresponding comments make it easier for everyone to understand the code. Each example provides MDK and IAR projects, and supports GCC development environment, developers After getting the project, you can see the experimental phenomenon by simply compiling and downloading it.

The routine list is as follows:

Numbered Category Folders	illustrate
01 Basic led_blink	LED flashes continuously
02 Basic key	Onboard buttons
03 Basic rgb_led	RGB LED color changing
04 Basic beep	Use buttons to control the buzzer
05 Basic ir	Simulated infrared remote control
06 Driving LCD	LCD displays text and images
07 Driving temp_humi	Driving temperature and humidity sensor
08 Driver als_ps	Driving light intensity/proximity sensor
09 Component fs_tf_card	TF card-based file system routine
10 Component fal	Use Flash Abstraction Layer (FAL) to manage Flash and partitions
11 Component kv	Use EasyFlash to store KV parameters
12 Component fs_flash	SPI Flash-based file system routine
13 Component ulog	Logging system routines
14 Component adbd	ADB remote debugging tool routine
15 Components MicroPython	Controlling Hardware with MicroPython
16 IoT wifi_manager	Use WiFi Manager to manage and operate WiFi networks
17 IoT web_config_wifi Use web to quickly access WiFi network	
18 Internet of Things Airkiss	Use AirKiss to quickly connect to WiFi networks
19 IoT atk_module	ATK module routines
20 IoT at_server	AT command (server side) routine
21 IoT MQTT	Use the Paho-MQTT package to implement MQTT protocol communication
22 IoT http_client	Implementing HTTP Client using the Web Client package
23 IoT web_server	Using the Web server component: WebNet
24 IoT websocket	Use the websocket package to communicate
25 IoT cjson	Parsing JSON data format routine
26 IoT TLS	TLS communication is accomplished using the mbedtls package
27 IoT hw_crypto	Hardware encryption and decryption function routines
28 Internet of Things ota_ymodem	OTA firmware upgrade via serial port Ymodem protocol

Numbered Category Folders	illustrate
29 Internet of Things ota_http	Complete OTA firmware upgrade via HTTP protocol
30 Internet of Things NetUtils	Network gadget set usage examples
31 IoT cloud_rtt	Access to RT-Thread IoT device management cloud platform
32 IoT cloud_onenet	Access to China Mobile OneNET cloud platform
33 IoT cloud_ali_iotkit Connect to Alibaba Cloud IoT Platform	
34 IoT cloud_ms_azure Connect to Microsoft Azure IoT platform	
35 IoT cloud_tencent	Access to Tencent Cloud IoT Platform
36 Comprehensive Demo	Comprehensive sample demonstration

3 WM_Librarie Introduction

WM_Librarie is a development software package provided by Beijing Lianshengde Microelectronics Co., Ltd., which provides the underlying hardware drivers, It has many basic functions, including WiFi protocol stack, firmware download, one-click network configuration, etc. The following describes the functions of these functions.

3.1 WM_Librarie Function Introduction

3.2 One-key network configuration function

One-touch network configuration function can send the WiFi name and password to the development board through the APP, so that the development board can access the WiFi network. Most mobile phones and routers on the market can be paired with the network with a high success rate and fast speed.

3.3 Chip Peripheral Driver Library

Provides driver support for various peripheral modules of W60X chip, including UART, SPI, TIMER, PWM, WDG, etc. High efficiency and small resource occupation.

3.4 WiFi Function Library

Provides complete WiFi protocol stack functions, including support for STA, SOFTAP, AP/STA. It makes it easier for general users to operate WiFi, and also enables advanced users to operate WiFi more flexibly.

3.5 Firmware packaging function

It provides a firmware packaging function suitable for various environments. The firmware generator is compiled using a cross-platform language and can run on multiple platforms. It can also generate multiple different types of firmware to suit different upgrade scenarios.

4 Documentation

4.1 SDK Documentation

SDK related documents are in the docs folder. The document list is as follows:

file name	illustrate
board folder	Development board related documentation, such as schematics and datasheets wait
AN0001-RT-Thread-Serial Device Application Note.pdf	Serial Port Driver Notes
AN0002-RT-Thread-General GPIO Device Application Note.pdf	General GPIO Device Application Note
AN0003-RT-Thread-I2C Device Application Note.pdf	I2C Device Application Notes
AN0004-RT-Thread-SPI Device Application Note.pdf	SPI Device Application Notes
AN0006-RT-Thread-Using QEMU for Simulation Debugging.pdf	Using QEMU to debug RT-Thread
AN0009-RT-Thread_ Using SystemView Analysis Tool.pdf	Using SystemView Debugging
AN0010-RT-Thread-Network Protocol Stack Driver Porting Notes.pdf	lwip driver porting
AN0011-RT-Thread-Network Development Application Note.pdf	Web Development Application Notes
AN0012-RT-Thread-File System Application Note.pdf	RT-Thread File System Application Notes
AN0014-RT-Thread-AT Component Application Notes - Client.pdf	RT-Thread AT Component Application Notes - Client
AN0017-RT-Thread-Creating Standard Projects.pdf	Create an RT-Thread standard project
AN0018-RT-Thread-Network Toolset Application Note.pdf	RT-Thread Network Toolset (NETUTILS) Application notes
AN0020-RT-Thread-Using Eclipse + QEMU Debugging.pdf	Using Eclipse + QEMU to debug RT-Thread
AN0021-RT-Thread-Using VS Code + QEMU debugging.pdf	Using VS Code + QEMU to debug RT-Thread
AN0022-RT-Thread-ulog Logging Component Application Note - Basics Article.pdf	RT-Thread ulog Logging Component Application Notes - Basics
AN0023-RT-Thread-Using QEMU to run dynamic modules.pdf	Using QEMU to run RT-Thread dynamic modules
AN0024-RT-Thread-ulog Logging Component Application Note - Advanced Article.pdf	RT-Thread ulog Logging Component Application Notes - Advanced Edition
AN0025-RT-Thread-Power Management Components Application Note.pdf	Power Management Application Notes
RT-Thread Programming Guide.pdf	RT-Thread Programming Guide
UM1001-RT-Thread-WebClient User Manual.pdf	WEBCLIENT User Manual
UM1002-RT-Thread-ali-iotkit User Manual.pdf	RT-Thread ALI-IOTKIT User Manual
UM1003-RT-Thread-OneNET User Manual.pdf	RT-Thread ONENET User Manual
UM1004-RT-Thread-OTA User Manual.pdf	RT-Thread OTA User Manual
UM1005-RT-Thread-Paho-MQTT User Manual.pdf	PAHO-MQTT User Manual
UM1006-RT-Thread-MbedTLS User Manual.pdf	RT-Thread MBEDTLS User Manual

file name	illustrate
UM1007-RT-Thread-Azure-IoT-SDK User Manual.pdf	AZURE-IOT-SDK User Manual
UM1008-RT-Thread-Device Maintenance Cloud Platform User Manual.pdf	RT-Thread Cloud Platform User Manual
UM1009-RT-Thread-Power Management Component User Manual.pdf	POWER MANAGEMENT User Manual
UM1010-RT-Thread-Web Server (WebNet) User Manual Book.pdf	RT-Thread WEBNET User Manual
UM3101-RT-Thread-W60X-SDK Development Manual.pdf	RT-Thread W60X SDK Development Manual
UM3102-RT-Thread-W60X-SDK Introduction.pdf	RT-Thread W60X SDK Description
UM3103-RT-Thread-W60X-SDK Quick Start Guide.pdf	RT-Thread W60X SDK Quick Start
UM3104-RT-Thread-W60X-SDK Release Notes.pdf	RT-Thread W60X SDK Development Manual

4.2 WM_Librarie Documentation

There are also many documents in the WM_Librarie library for your reference and study. The following only introduces some documents related to the current SDK. The path is: RT-Thread_W60X_SDK/libraries/WM_Libraries/Doc.

file name	illustrate
OneShot Lib&Demo folder	One-click network configuration source code and APP
W60X_QFLASH_Driver_for_SWD folder	Keil uses JTAG debugging QFLASH drive
WM_W600_OneShotConfig2.0(Android) SDK User Manual _V1.0.pdf	One-click Network Configuration Android SDK User Manual
WM_W600_OneShotConfig2.0(IOS) SDK User Manual_V1.0.pdf	One-click network configuration IOS SDK User Manual
WM_W600_ROM Function Description_V1.1.pdf	ROM Function User Manual
WM_W600_SECBOOT Function Description_V1.0.pdf	SECBOOT Functional Description Manual
WM_W600_SWD Debug Configuration Guide_V1.2.pdf	SWD Debug Configuration Manual
WM_W600_Parameter Area Instructions_V1.1.pdf	Parameter Area User Manual
WM_W600_ Firmware Upgrade Guide_V1.1.pdf	Firmware Upgrade Instructions
WM_W600_ Firmware Generation Instructions_V1.1.pdf	Firmware Generation Instructions Manual
WM_W601_Register Manual_v1.2.pdf	Register Manual

5 Preliminary Knowledge

The prerequisites for using the W60X SDK are as follows:

- RT-Thread basics

- RT-Thread development environment

Basic knowledge of RT-Thread can be learned from the RT-Thread Document Center .