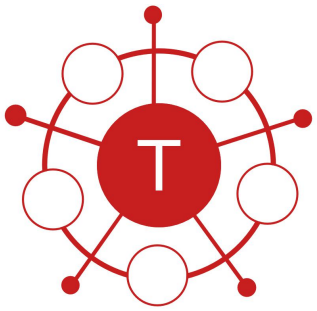

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W600 Series User’s Manual

version_V1.0.0

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FCC ID: 2ASQV-TW-03

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: 1) this device may not cause harmful interference, and 2) this device must accept any interference received, including interference that may cause undesired operation.

Version specification

Data	Versuin	Author	Release Notes
2019.1.12	V1.0	Lvx	First Version

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1. General Description

W600 series WiFi module products include three types of WiFi modules: TW-01, TW-02 and TW-03. It is a series of UART-WiFi modules developed by Shenzhen ThingsTurn Technology Co. Ltd.

W600 Series Modules are an embedded Wi-Fi SoC Module which is complying with IEEE802.11b/g/n (1T1R) international tandard and which supports multi interface, multi-protocol. It can be easily applied to smart appliances, smart home, health care, smart toy, and wireless audio & video, industrial and other IoT field.

W600 Series Modules integrates Cortex-M3 CPU, Flash, RF Transceiver, CMOS PA, Baseband control. It applies multi interfaces such as SDIO, SPI, UART, GPIO, I²C, PWM, I²S, 7816 etc. It applies multi encryption and decryption

protocol such as PRNG (Pseudo Random Number Generator), SHA1, MD5, RC4, DES, 3DES, AES, CRC etc。

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Product Features

- Integrated 288KB RAM;
- Integrated 1MB FLAS
- Integrated 2 UART interface, support RTS/CTS, baud rate: 1200bps~2Mbp
- Integrated one high speed SPI controller,operating frequency: 0~50MH
- Integrated I²S controller, support full duplex and codec from 32KHz to 192KH
- Integrated one I²C controller, support data transmission rate 100/400Kbp
- Integrated PWM controller, support 5 channel PWM output or 2 channels PWM input capture. Max output frequency is 20MHz and max input frequency is 20MHz;
- Integrated 7816 interface, support ISO-7816-3 T=0/1, EVM2000 protocol and UART protocol
- Integrated encrypted hardware accelerator,support PRNG(Pseudo random Number Generator), SHA1, MD5, RC4, DES, 3DES, AES, CRC;
- Support 20/40M bandwidth;
- Support Keil and eclipse development environment;

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1. Module Interface

1.1 package size

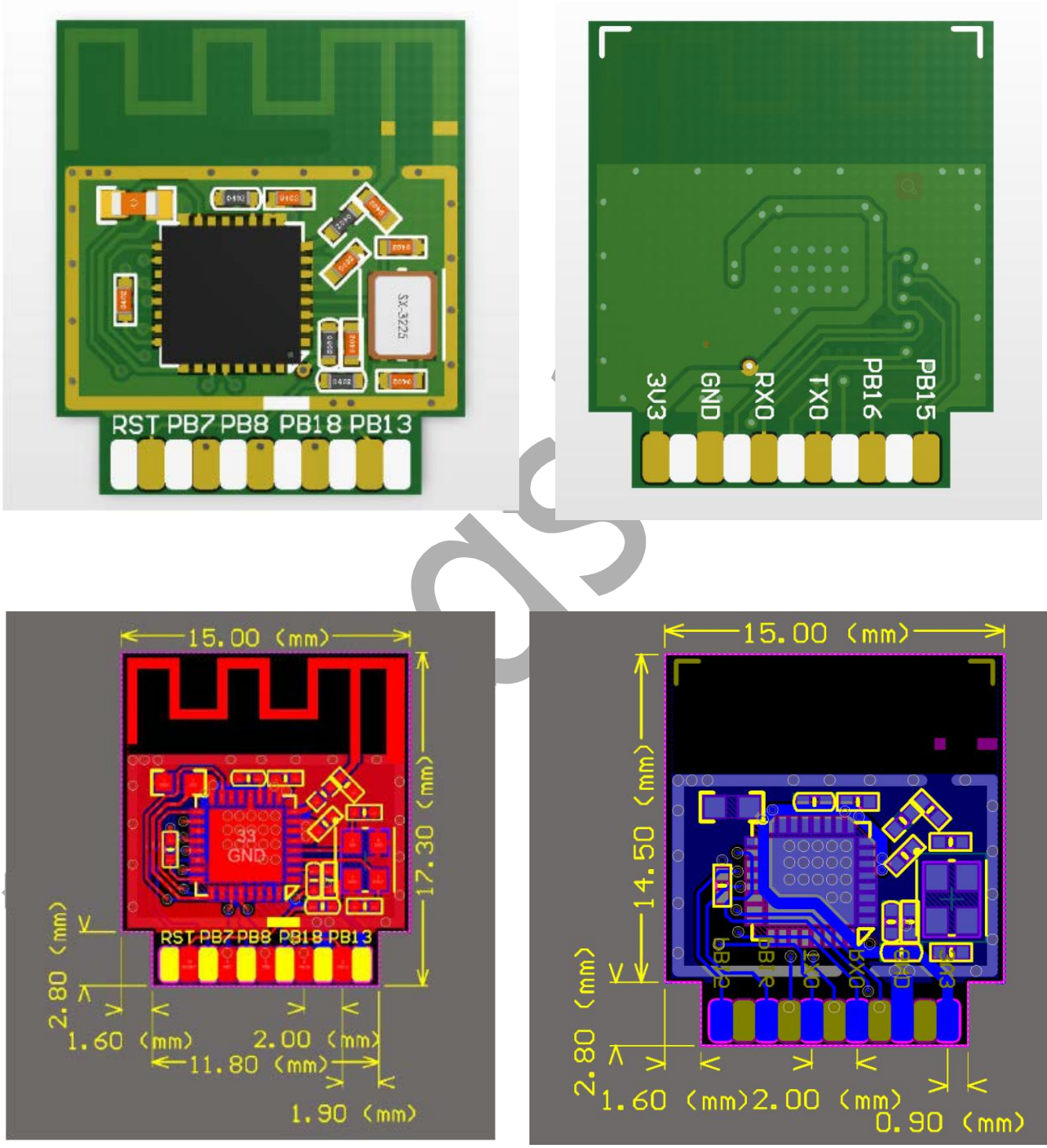

Figure 1.1 tw-02 pin dimensions

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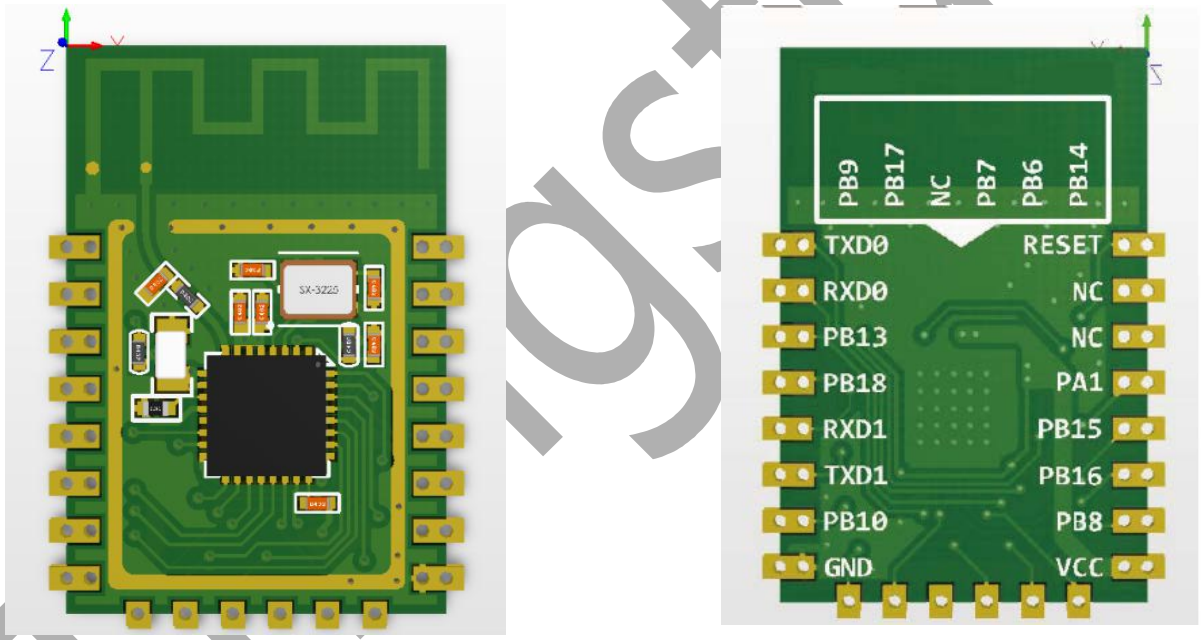

Figure 1.2 tw-03 pin dimensions

1.2 Module Selection

Module	Package	Antenna	Size	Layer
TW-02	SMD-9	PCB	15*17.3*3±0.2mm	2
TW-03	DIP-22	PCB	24*16*3±0.2mm	2

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1.3 Pin Definition

Pin Number		Pin Name	Explain
TW-02	TW-03		
10	1	RESET	Reset Pin,Active Low
-	2	NC	NC
-	3	NC	NC
-	4	PA1	SIM_DATA、PWM_2、SPI(M/S)_CK、GPIOPA_1
11	5	PB15	PWM_4、SPI(M/S)_CS、I²S_S_SCL、GPIOPB_15
9	6	PB16	PWM_3、SPI(M/S)_CK、I²S_S_RL、GPIOPB_16
6	7	PB8	H_SPI_CK、SDIO_CK、I²S_M_SCL、GPIOPB_8
1	8	VCC	Module Power supply by 3.3V
-	9	PB14	PWM5、I²CDAT、I²SSSDA、GPIOPB_14
-	10	PB6	SWDAT、UART0_RX、PWM_4、SIM_CLK、GPIOPB_6
8	11	PB7	SWCK、UART0_TX、SDIO_CMD、SPI(M/S)_CS、GPIOPB_7
-	12	NC	NC
-	13	PB17	PWM2、SPI(M/S)DI、UART1RX、GPIOPB_17
-	14	PB9	H_SPI_INT、SDIO_DAT0、I²S_M_SDA、GPIOPB_9
3	15	GND	GND
-	16	PB10	H_SPI_CS、SDIO_DAT1、I²S_M_RL、GPIOPB_10
-	17	TXD1	H_SPI_DO、SDIO_DAT3、I²C_DAT、GPIOPB_12
-	18	RXD1	H_SPI_DI、SDIO_DAT2、I²C_SCL、GPIOPB_11

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4	19	PB18	PWM_1、SPI(M/S)_DO、UART1_TX、GPIOPB_18
2	20	PB13	I²C_SCL、SDIO_CMD、GPIOPB_13
5	21	RXD0	PWM_1、SPI(M/S)_DI、I²S_M_EXTCLK、GPIOPA_5
7	22	TXD0	PWM_5、SPI(M/S)_DO、I²S_M_SCL、GPIOPA_4

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2. Electrical characteristics

2.1 Limit parameter

parameter	Name	Min	Type	Max	Unit
Supply Voltage	VDD	3.0	3.3	3.6	V
Input logic level low	VIL	-0.3	-	0.8	V
Input logic level hight	VIH	2.0	-	VDD+0.3	V
Input pin Capacitance	Cpad	-	-	2	pF
Output logic level low	VOL	-	-	0.4	V
Output logic level hight	VOH	2.4	-	-	V
Maximum Driving Capability	IMAX	-	-	24	mA
Storage temperature range	TSTR	-40℃	-	+125℃	℃
Operating Temperature Range	TOPR	-40℃	-	+85℃	℃

2.2 Transmit Power

Mode	Type	Unit
Send IEEE802.11b,CCK 11Mbps, POUT = +19 dBm	230	mA
Send IEEE802.11g,OFDM 54Mbps, POUT = +13.5 dBm	210	mA
Send IEEE802.11n,OFDM MCS7,	210	mA

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POUT = +12dBm		
Receive IEEE802.11b/g/n	100-110	mA

2.3 Wi-Fi Radio Characteristics

Parameters	Type	Unit
Input frequency	2.4GHz~2.4835MHz	
Nominal power		
72.2 Mbps PA	12	dBm
11b 模式 PA	19	dBm
Sensitivity		
DSSS, 1 Mbps	-95	dBm
CCK, 11 Mbps	-86	dBm
OFDM, 6 Mbps	-89	dBm
OFDM, 54 Mbps	-73	dBm
HT20, MCS0	-89	dBm
HT20, MCS7	-71	dBm
HT40, MCS0	-85	dBm
HT40, MCS7	-68	dBm
Adjacent Channel Rejection		
OFDM, 6 Mbps	32	dB
OFDM, 54 Mbps	15	dB

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HT20, MCS0	29	dB
HT20, MCS7	10	dB

4. Hardware Guide

4.1 Typical Applications

Note: You can't use USB to TTL 3.3V or 5V power supply, it is recommended to use two dry batteries or after conversion through the LDO 3.3V, it is strongly recommended to buy a new development board.

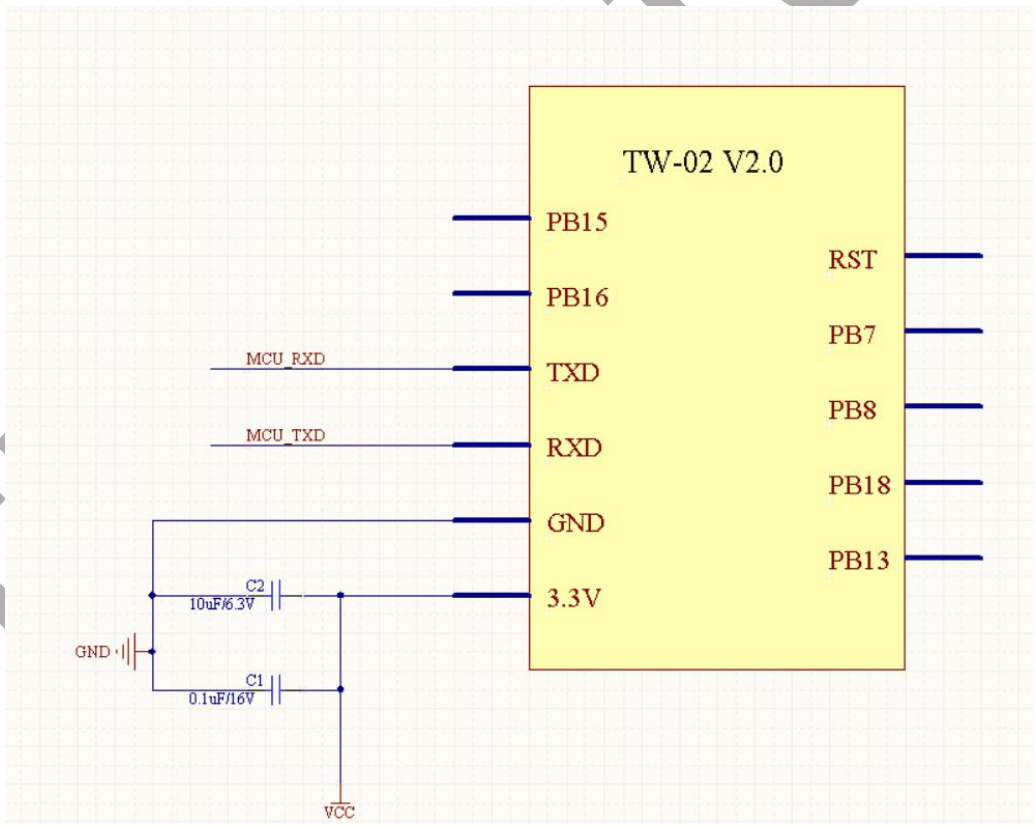

Figure 4.1 Typical Applications for TW-02

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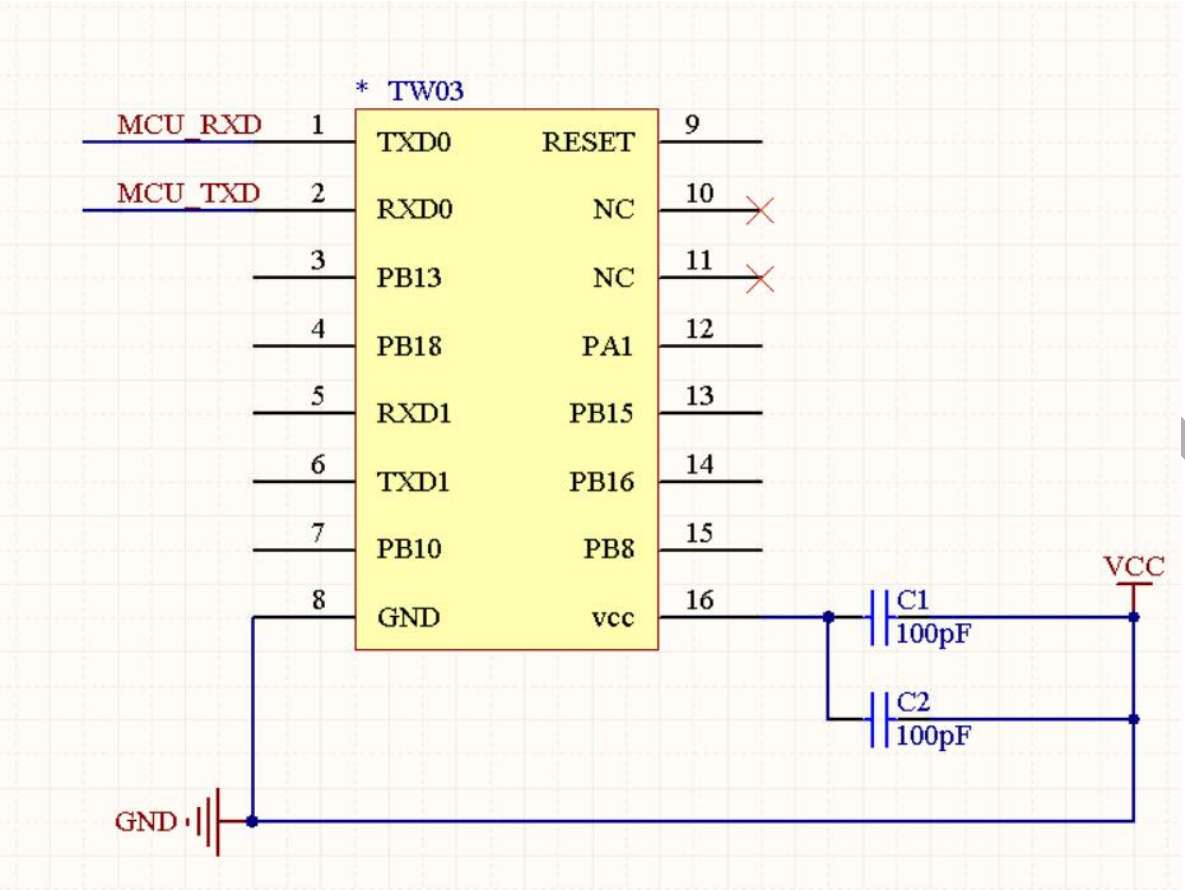

Figure 4.2 Typical Applications for TW-02

4.2 GPIO Level Conversion

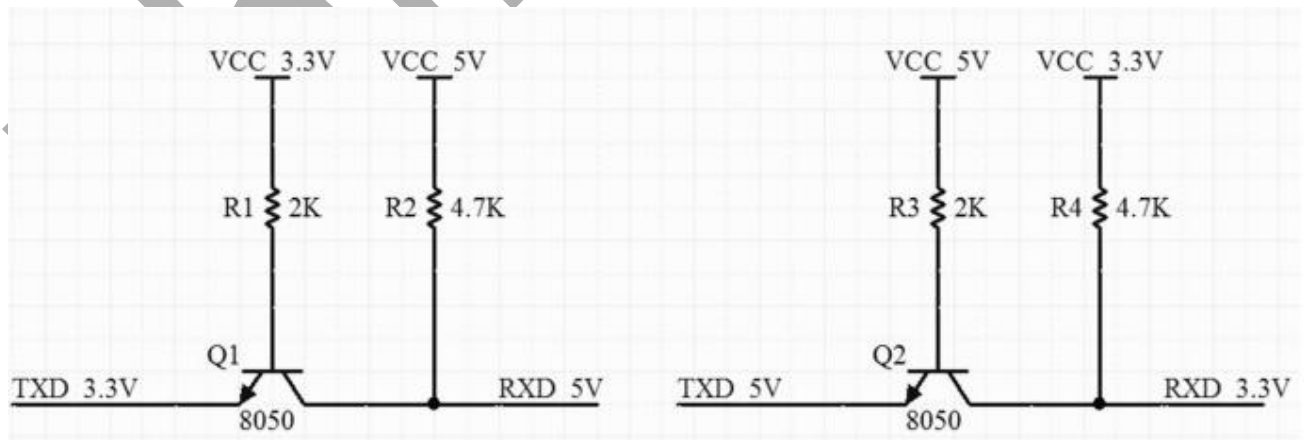

Figure 4.3 Transistor level conversion

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4.3 Power Supply Reference Design

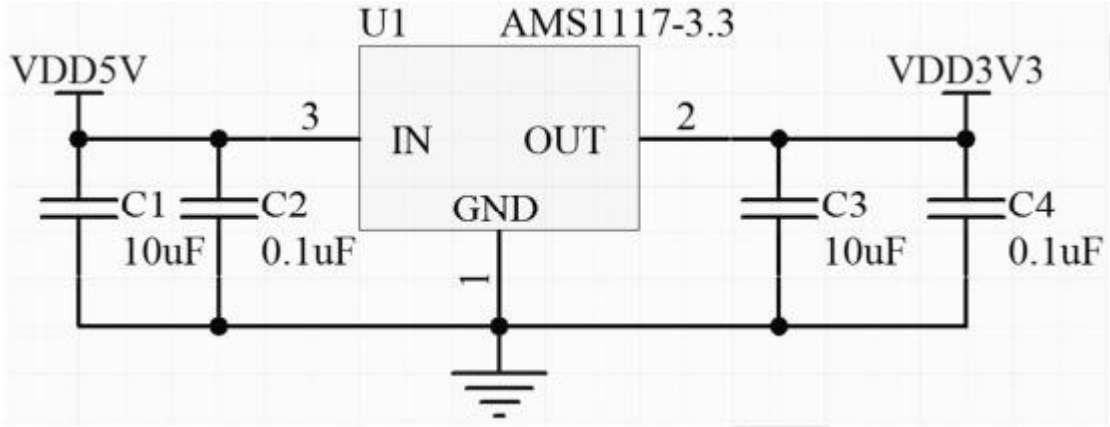

Figure 4.4 Power Supply reference

4.4 Automatically Download Reference Design

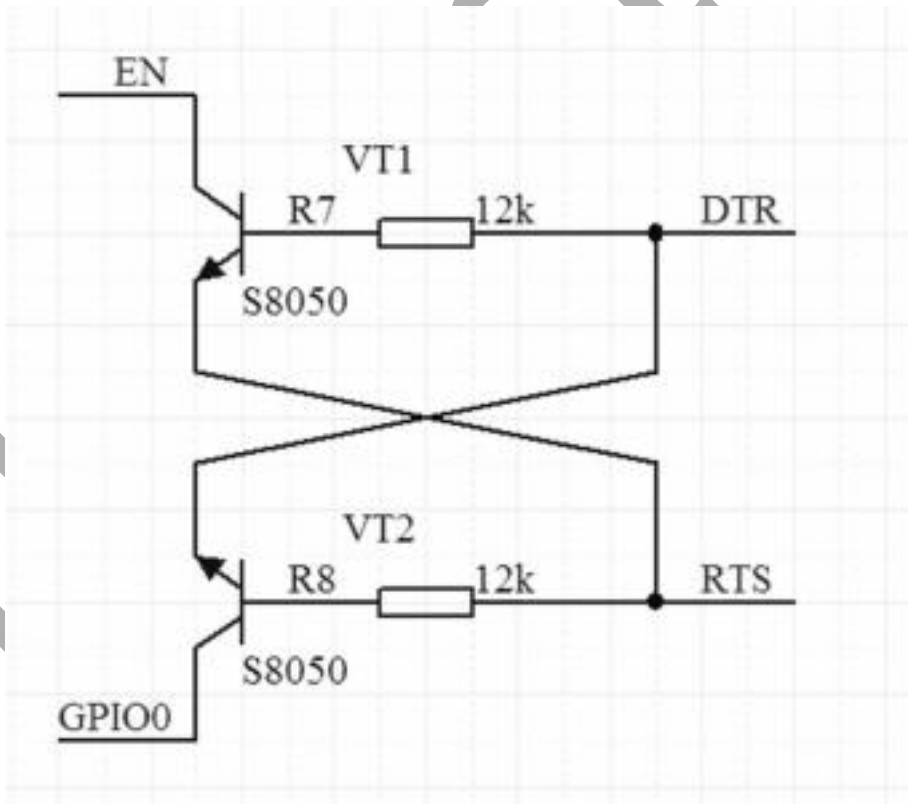

Figure 4.5 Automatically Download Reference Design

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5. Usage Guide

W600 series module factory default built-in AT firmware, and the default baud rate of 115200, can refer to 4.1 typical application diagram to build the minimum system circuit, then the AT command operation.

5.1 AT Instruction Development

This chapter only describes the common AT commands. See the link for the basic tutorial: http://docs.thingsturn.com/at/start

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5.1.1 AT

Parameters	No
Description	Test
Example	AT OK

5.1.2 AT+GMR

Parameters	No
Description	View firmware version information
Example	AT+GMR AT version:1.1.5(Dec 20, 2018 00:27:26) SDK version:3.0.0 ThingsTurn Technology Co., Ltd. Dec 20, 2018 00:27:26 OK

5.1.3 AT+RST

Parameters	No
Description	Restart Module

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Example	AT+RST OK

5.1.4 AT+RESTORE

Parameters	No
Description	Reset the module to factory settings
Example	AT+RESTORE OK

5.2 Example for AT instructions

For an example of AT instructions, please refer to: http://docs.thingsturn.com/development/at/

This link contains the basic usage of W600 series module AT instructions as well as TCP/UDP.

5.3 SOC development

W600 series module supports secondary development,Our company provides basic SDK packages and development documents to facilitate developers'development.

At the same time, we also provide Aliso Things, RT Thread, Arduino, Python and other development kits.

Please refer to the link: http://docs.thingsturn.com

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6. Connect Us

Official website: https://www.thingsturn.com/

Develop Wiki: http://docs.thingsturn.com/

Technical support: support@thingsturn.com/

Sample purchase: https://shop387867913.taobao.com/

Company Address:303#,Building B,TengYao Building,No.268 Gushu Second Road,Baoan District,Shenzhen,China

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The host will Satisfy Class I or Class Ⅱ permissive change based this module FCC ID.

If the FCC identification number is not visible when the module is installed inside the host, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module Contains FCC ID:2ASQV-TW-03 or "Contains FCC ID:2ASQV-TW-03.Any similar wording that expresses the same meaning may be used.

Warning:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.
NOTE: This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter

RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance of 20C m the radiator your body. This device and its antenna(s) must not be co-located or operation in conjunction with any other antenna or transmitter

This device is intended only for OEM integrators under the following conditions:
1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna,
3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.
As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed