HK NATER TECH LIMITED

WL-UM01-7681 Specification

Customer: _____

Description: WL-UM01-7681-V1.1

Customer P/N:_____

Date: _____

Customer		
Approve	Auditing	Admit

Provider		
Approve	Auditing	Admit

Customer:
Add:
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SPECIFICATION

IEEE 802.11 b/g/n 2.4GHz 1T1R WiFi
UART INTERFACE

WL-UM01-7681 (MT7681)
UART Module

Version 1.1

1.PRODUCT DESCRIPTION

The MT7681 is a highly integrated Wi-Fi SoC(system on Chip) single chip, which supports IEEE802.11b/g/n single stream, providing GPIO and PWM for intelligent control, and UART, SPI, and I2C interfaces for device communication.

The MT7681 integrate power amplifier, low noise am plifier, and RF switch to reduce the module size and RF design capability required. And also integrate power manage unit for single 3.3V power source for cost effective design.

The MT7681 embedded 32-bit RISC MCU for 802.11b/g/n drivers, supplicant, TCP/IP protocol stack, and networking applications, can be operated in station mode and softAP mode.

The MT7681 is an ideal solution for embedded device to enable networking service with minimized design effort.

2. Features

- Single stream IEEE 802.11 b/g/n
- 32-bit RISC microprocessor as the host MCU
- Embedded IEEE 802.11b/g/n drivers, supplicant, and TCP/IP stack
- Highly integrated RF PA, LNA, and RF switch
- Integrate high efficiency switching regulator for single 3.3V power source
- Security support for WFA WPA/WPA2 personal, WPS2.0, WAPI
- Operation in station mode or softAP mode
- Rich interfaces, UART, SPI, I2C, PWM and GPIOs
- UART interface Low Halogen compliance

3. Applications

- Home automation
- Smart plug
- Lighting
- Metering
- Remote control
- Network consumer devices

4.Diagram

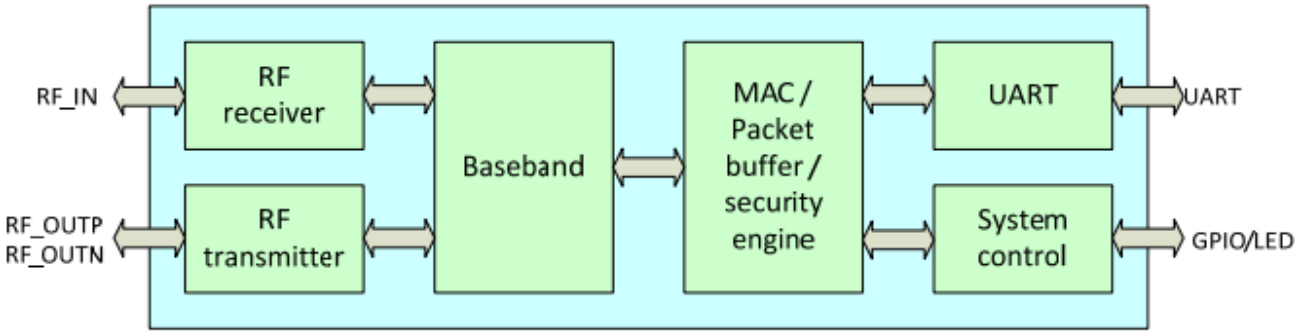


Figure 1 MT7681 block diagram

5.Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	125	℃
Ambient Operating Temperature	0	70	℃
Junction Temperature	0	125	℃

6.PRODUCT SPECIFICATIONS

Main chipset :WiF Single Chip: MT7681

Functional Specifications

Model	WL-UM01-7681-V1.1
Major Chipset	MT7681
Standards	WiFi: EEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11n
Bus Interface	WiFi: UART
Data Rate	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 7 for HT20MHz ;MCS 0 to 7 for HT40MHz
Modulation Techniques	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: 64 QAM, 16 QAM, QPSK, BPSK

Operating Channel	WiFi 2.4GHz: 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan
Frequency Range	2.400GHz ~ 2.4835 GHz
Security	WiFi : WPA, WPA2 , WPS2.0, WAPI
OS supported	Linux/Android

7.Power Supply DC Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Units
VDD33	3.3V Supply Voltage	2.97	3.3	3.63	V
VDD12	1.2V Supply Voltage	1.14	1.2	1.26	V
VDD15	1.5V Supply Voltage	1.425	1.5	1.575	V
IDD33	3.3V Rating Current	-	-	600	mA

DC Characteristics

Module	Voltage	Current Consumption (linking)
WL-UM01-7681-V1.1	3.3V	250mA（上网或者看电影时的功耗）

8.Electrical Specifications

1) RF Characteristics for IEEE802.11b (11Mbps mode unless otherwise specified)

Items	Contents			
Specification	IEEE802.11b			
Mode	CCK 11 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤85 dBm@8%)	-85 dBm			
FREQ ERR LIMIT	±13PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (17±2 dBm)		17		dBm
EVM (≤-18)		-18		dB

2) RF Characteristics for IEEE802.11g (54Mbps mode unless otherwise specified)

Items	**Contents**			
Specification	IEEE802.11g			
Mode	OFDM 54 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤70 dBm@10%)	-70 dBm			
FREQ ERR LIMIT	±13PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (14±2dBm)		14		dBm
EVM (≤-27)		-27		dB

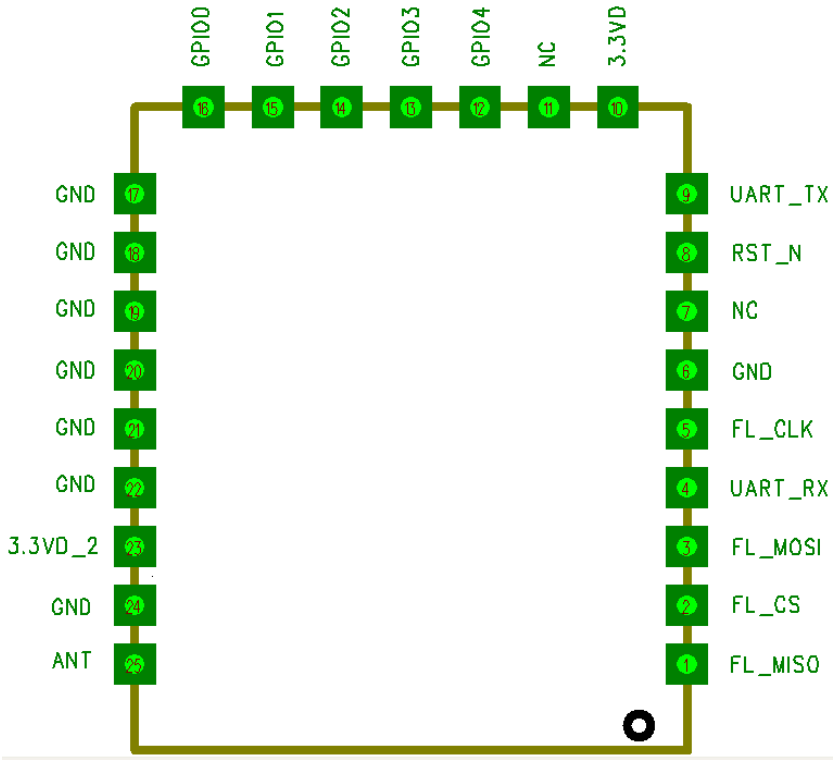
3) RF Characteristics for IEEE802.11n (BW20_MCS7)

Items	**Contents**			
Specification	IEEE802.11n (BW20_MCS7)			
Mode	BW20_MCS7 65 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
FREQ ERR LIMIT	±13PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (13±2 dBm)		13		dBm
EVM (≤-28)		-28		dB

4) RF Characteristics for IEEE802.11n (BW40_MCS7)

Items	**Contents**			
Specification	IEEE802.11n (BW40_MCS7)			
Mode	BW40_MCS7 135 Mbps			
Channel frequency	2412 ~ 2484 MHz			
RX (per≤65 dBm@10%)	-65 dBm			
FREQ ERR LIMIT	±13PPM			
TX Characteristics	Min.	Typ.	Max.	Unit
Power Level (13±2 dBm)		13		dBm
EVM (≤-28)		-28		dB

9.MODULE PIN ASSIGNMENT

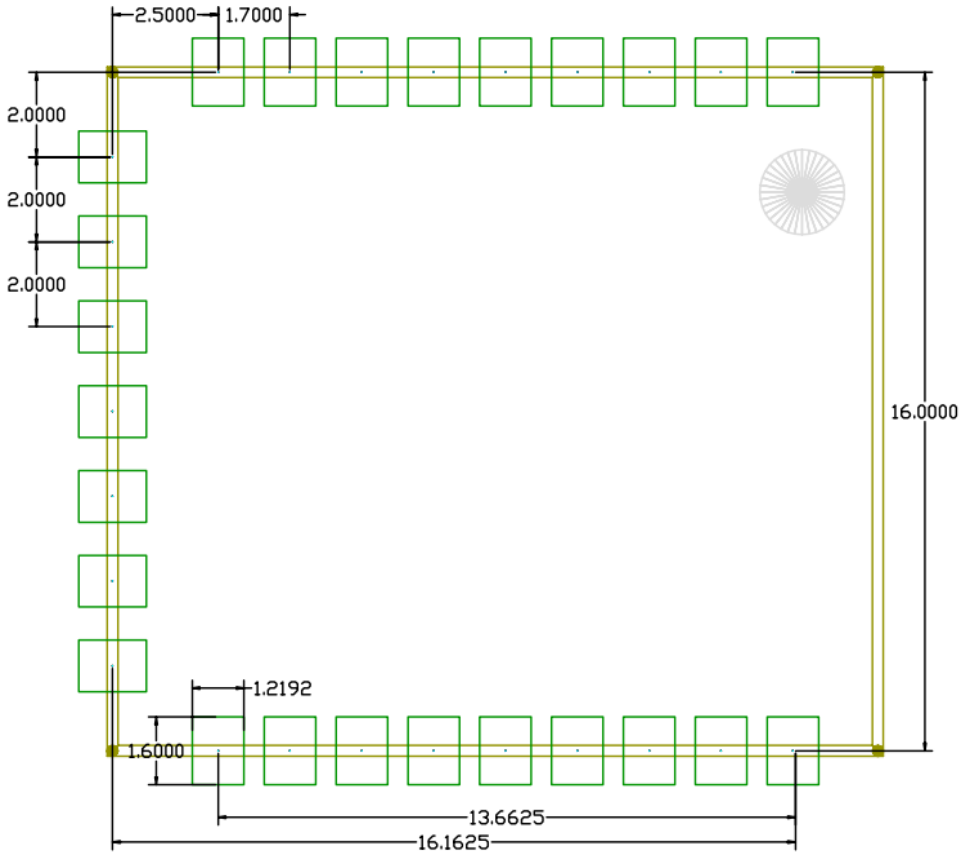


PIN	Function	Description
1	FL_MISO	External memory data input
2	FL_CS	External memory chip select
3	FL_MOSI	External memory data output
4	UART_RX	UART_RX
5	FL_CLK	External memory clock
6	GND	GND
7	NC	NC
8	RST_N	External system reset active low
9	UART_TX	UART_TX
10	3.3VD	3.3V
11	NC	NC
12	GPIO4	GPIO4
13	GPIO3	GPIO3
14	GPIO2	GPIO2
15	GPIO1	GPIO1

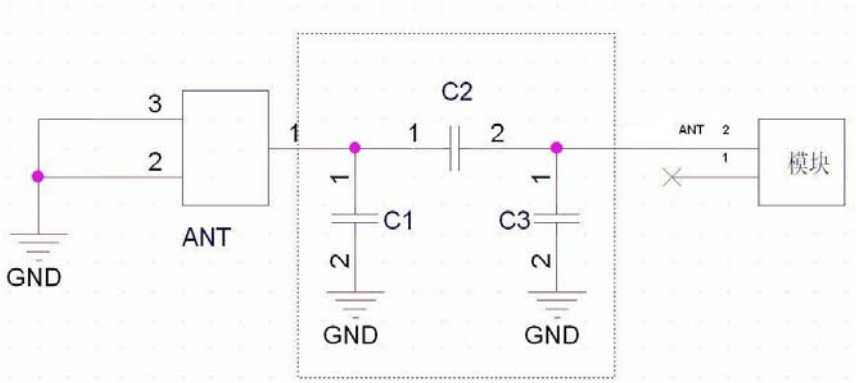
16	GPIO0	GPIO0
17	GND	Grond
18	GND	Grond
19	GND	Grond
20	GND	Grond
21	GND	Grond
22	GND	Grond
23	3.3VD_2	3.3V
24	GND	Grond
25	ANT	Antenna

10.Mechanical

Dimensions (mm)	Length	Width	Height
	18.6 (Tolerance:±0.2mm)	**16.0 (Tolerance:±0.2mm)**	**1.6 (Tolerance:±0.2mm)**



11.1.WIFI RF Circuit reference pictures

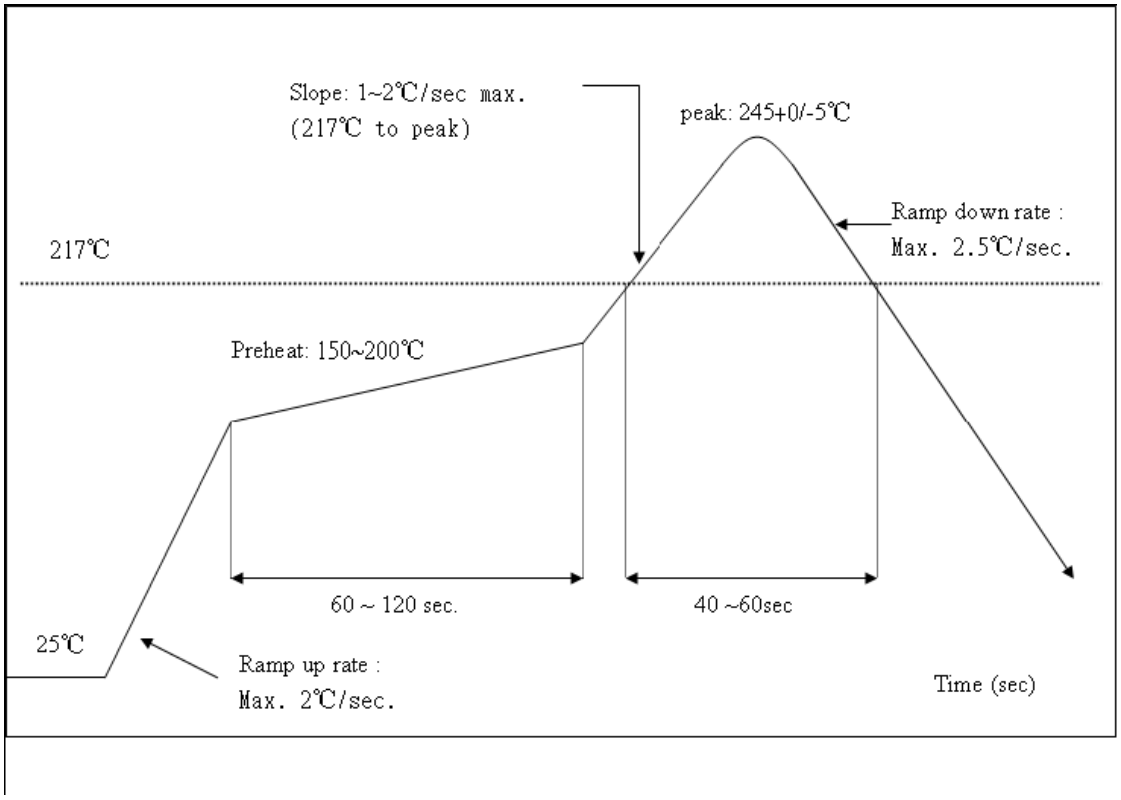


注:1.以上虚线框的部分需要进行天线匹配，以实际天线匹配的电子元器件参数为准.
2.以上为 RF 走线要做 50 欧姆阻抗，走线不能走 90 度，走线长度不能超过 15mm.

Note: The RF part layout must do 50 Ωimpedance.，can't get the line go 90°，can't get the line longer than 15 mm.

12.Recommended Reflow Profile

Referred to IPC/JEDEC standard.
Peak Temperature : <250°C
Number of Times : ≤2 times



ENVIRONMENTAL

Operating

Operating Temperature: 0°C to +70 °C
Relative Humidity: 5-90% (non-condensing)

Storage

Temperature: -40°C to +80°C (non-operating)
Relevant Humidity: 5-95% (non-condensing)

MTBF caculation

Over 150,000hours

13.Wireless module before the SMT note:

1.When customers Open stencil must be sure the hole bigger to the Wireless module plate, please press 1 to 1 and 0.7 mm is widened to open outward, the thickness of 0.12 mm.

2.Can't get the wifi module bare hands when needs,must we wear the gloves and static ring.

3.The furnace temperature according to the size of the customer the mainboard ,generally like to stick on a tablet standard temperature of 250 + - 5,can do 260 + - 5.

Storage and use Wifi module control should pay attention to the following matters:

1.Module of the storage life of vacuum packaging：

1-1.Storage life： 12 months. Storage conditions:<40℃. Relative humidity:<90%R.H.

1-2.After this bag is opened , devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be :

1-3.Check the humidity card :stored at ≦20%RH.If :30%~40%(pink)or greater than 40%(red).Labeling module has moisture absorption.

① Mounthed within 168 hours at factory conditions of: t≦30%℃，≦60%R.H.

② Once opened, the workshop the preservation of life for 168 hours.

1-4.If baking is required,devices may be baked for:

① Modules must be to remove module moisture problem.

② Baking temperature: 125 ℃, 8 hours.

③ After baking, put proper amount of desiccant to seal packages.

1-5. The actual number of module vacuum packing which is based on the actual number of packages to the customer requirements.

2.Module reel packaging items as follows.

2-1.Storage life： 12 months. Storage conditions:<40℃. Relative humidity:<90%R.H.

2-2.Module apart packing after 168 hours，To launch patch need to bake, to remove the module hygroscopic, baking temperature conditions：125℃，8hours.

2-3. The actual number of module reel packing which is based on the actual number of packages to the customer requirements.

3.Module pallet packaging items as follows：

3-1.Storage life： 3 months. Storage conditions:<40℃. Relative humidity:<90%R.H.

3-2.Module if not used within 48 hours, before launch the need for baking, baking temperature: 125 ℃, 8 hours.

3-3. Pallet packaging each plate is 100 PCS.The actual number of module pallet packing which is based on the actual number of packages to the customer requirements.

13.Wifi 模块贴片装机前注意事项：

1.客户在开钢网时一定要将 wifi 模块焊盘的孔开大，请按 1 比 1 再向外扩大 0.7mm 比例开钢网，厚度按 0.12mm.

2.有需要拿 wifi 模块时不可以光手去拿，一定要戴上手套以及静电环.

3.过炉温度要根据客户主板的大小而定，一般像平板电脑上的标准温度为250+-5°，也可以做到260+-5°

Wifi 模块储存及使用管制应注意事项如下：

1.模块的真空包装之储存期限：

1-1.保存期限：12个月，储存环境条件：温度在：<40℃，相对湿度：<90%R.H.

1-2.模块包装被拆后，SMT 组装之时限：

1-3.检查湿度卡：显示值应小于30%（蓝色），如：30%~40%(粉红色）或者大于40%（红色）表示模块已吸湿气.

① 工厂环境温度湿度管制：≦30%℃，≦60%R.H。

② 拆封后，车间的保存寿命为 168 小时.

1-4.如在拆封后的 168 个小时内未使用完，需要烘烤，烘烤条件如下：

① 模块须重新烘烤，以除去模块吸湿问题.

② 烘烤温度条件：125℃，8 小时.

③ 烘烤后，放入适量的干燥剂再密封包装.

1-5. 模块真空包装数量以客户要求的实际包装数量为准

2.模块卷盘包装事项如下：

2-1.保存期限：12个月，储存环境条件：温度在：<40℃，相对湿度：<90%R.H.

2-2.模块拆开包装168小时后，如要上线贴片需要重新烘烤，以除去模块吸湿问题，烘烤温度条件：125℃，8小时。

2-3. 模块卷盘包装以客户要求的实际包装数量为准.

3.模块托盘包装事项如下：

3-1.保存期限：3个月，储存环境条件：温度在：<40℃，相对湿度：<90%R.H.

3-2.模块如在 48 小时内未使用，在上线之前需要进行烘烤，烘烤温度条件：125℃，8 小时。

3-3. 托盘包装每盘为 100pcs，模块托盘包装以客户要求的实际包装数量为准.

注：以上包装方式根据客户要求而定，包装以实际出货为准.