

版本 Version: V1.2

日期 Date: 2015.07.20

名称: WIFI 模块

Name: Wifi Module

型号 : CDT-B176810-00

Model: CDT-B176810-00

软件:

Software:

客 户 CUSTOMER	客户承认 APPROVE (请盖印章)	日 期 DATE

深圳市中龙通电子科技有限公司

CHINA DRAGON TECHNOLOGY LIMITED

工厂地址: 深圳市宝安区沙井街道南浦路林坡坑蚝三第一工业园 B4 栋

电话: (86 755) 81449957

传真: (86 755) 81449967

E-mail: Info@cdtech.com[Http://www.cdtech.cn](http://www.cdtech.cn)

技术支持热线: 13902924823

客服专员: 13823632451

DESIGN: _____

CHECK: _____

APPROVAL: _____

Cdtech Technology

**CDT-B176810-00
Smart WLAN Module**

802.11b/g/n

Revision History

Date	Revision Content	Revised By	Version
2014.09.20	Initial release	Daniel	1.1
2014.10.08	Modify Pin Definition	Daniel	1.2
2015.07.20	Change Shape, add I-PEX	Daniel	1.3

Table of Contents

Table of Contents	4
1. General Descriptions.....	5
2. Features.....	5
3. Applications	5
4. Block Diagram	6
5. General specification.....	6
5.1 Wi-Fi RF Specification.....	6
5.2 Electrical characteristics.....	7
5.2.1 Absolute maximum rating.....	7
5.2.2 Recommended operating range.....	7
5.2.3 Thermal characteristics.....	8
5.2.4 Current consumption.....	8
6. Pin assignments.....	9
6.1 Pin Layout.....	9
6.2 Pin Definition.....	10
6.3 Recommended Footprint.....	11
7. Recommended Reflow Profile	12

1. General Descriptions

The CDT-B176810-00 is a highly integrated Wi-Fi Module, 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 CDT-B176810-00 integrate power amplifier, low noise amplifier, 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 CDT-B176810-00 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 CDT-B176810-00 is an ideal solution for embedded device to enable networking service with minimized design effort.

All the features are available in compact 18pin, 16.5x14mm QFN package.

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
- All functions integrates in compact 16.5mm x 14mm QFN18 package
- UART interface

3. Applications

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

4. Block Diagram

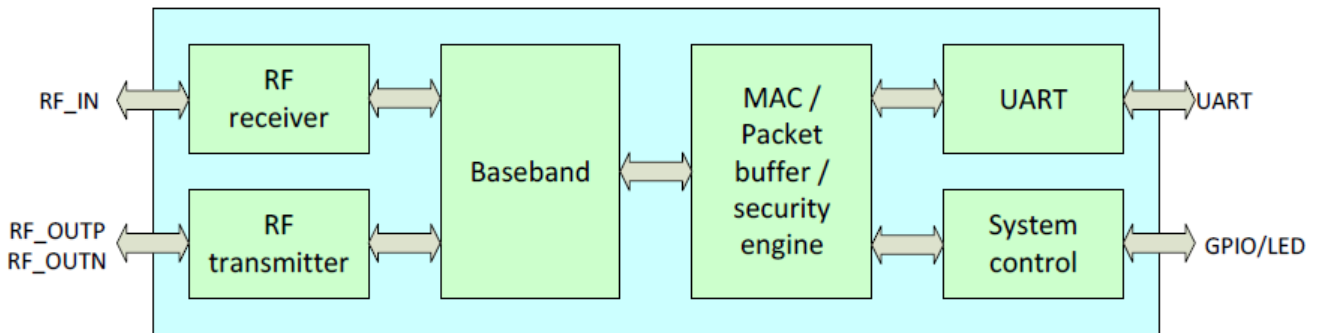


Figure 1 MT7681 block diagram

5. General Specification

5.1 Wi-Fi RF Specification

Conditions : VDDIO=3.3V ; Temp:25°C

Feature	Description
Model Name	CDT-B176810-00
WLAN Standard	IEEE 802.11b/g/n, WiFi compliant
Host Interface	UART
Dimension	L x W x H: 21.5 x 14.5 x 2.5 (typical) mm
Frequency Range	2.412 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)
Number of Channels	11 for North America, 13 for Europe, and 14 for Japan
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 17 dBm ± 1.5 dB @ EVM ≤ -9.12dB
	802.11g /54Mbps : 15 dBm ± 1.5 dB @ EVM ≤ -25dB
	802.11n /65Mbps : 14 dBm ± 1.5dB @ EVM ≤ -28dB
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -85 ± 1dBm, typical
	- MCS=1 PER @ -84 ± 1dBm, typical
	- MCS=2 PER @ -82 ± 1dBm, typical
	- MCS=3 PER @ -80 ± 1dBm, typical
	- MCS=4 PER @ -77 ± 1dBm, typical
	- MCS=5 PER @ -73 ± 1dBm, typical
	- MCS=6 PER @ -71 ± 1dBm, typical
	- MCS=7 PER @ -69 ± 1dBm, typical
- 6Mbps PER @ -87 ± 1dBm, typical	

Receive Sensitivity (11g) @10% PER	- 9Mbps	PER @ -86 ± 1dBm, typical
	- 12Mbps	PER @ -85 ± 1dBm, typical
	- 18Mbps	PER @ -83 ± 1dBm, typical
	- 24Mbps	PER @ -81 ± 1dBm, typical
	- 36Mbps	PER @ -78 ± 1dBm, typical
	- 48Mbps	PER @ -74 ± 1dBm, typical
	- 54Mbps	PER @ -72 ± 1dBm, typical
Receive Sensitivity (11b) @8% PER	- 1Mbps	PER @ -90 ± 1dBm, typical
	- 2Mbps	PER @ -89 ± 1dBm, typical
	- 5.5Mbps	PER @ -87 ± 1dBm, typical
	- 11Mbps	PER @ -84 ± 1dBm, typical
Data Rate	802.11b : 1, 2, 5.5, 11Mbps	
	802.11g : 6, 9, 12, 18, 24, 36, 48, 54Mbps	
Data Rate	802.11n : 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2Mbps	
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	
Operating temperature	-20°C to 85°C	
Storage temperature	-40°C to 85°C	
Humidity	Operating Humidity 10% to 95% Non-Condensing Storage Humidity 5% to 95% Non-Condensing	

5.2 Electrical characteristics

5.2.1 Absolute maximum rating

Symbol	Parameters	Maximum rating	Unit
VDD33	3.3V Supply Voltage	-0.3 to 3.6	V
VDD12	1.2V Supply Voltage	-0.3 to 1.5	V
VDD15	1.5V Supply Voltage	-0.3 to 1.8	V
T _{STG}	Storage Temperature	-40 to +125	°C
VESD	ESD protection (HBM)	2000	V

Table 1 Absolute maximum ratings

5.2.2 Recommended operating range

Symbol	Rating	MIN	TYP	MAX	Unit
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
T _{AMBIENT}	Ambient Temperature	-10	-	70	°C

Table 2 Recommended operating range

5.2.3 Thermal characteristics

Symbol	Description	Performance	
		TYP	Unit
T_J	Maximum Junction Temperature (Plastic Package)	125	°C
Θ_{JA}	Junction to ambient temperature thermal resistance ^{[1][2]}	48.11	°C/W
Θ_{JC}	Junction to case temperature thermal resistance	TBD	°C/W
Ψ_{Jt}	Junction to the package thermal resistance	3.23	°C/W

Table 3 Thermal information

5.2.4 Current consumption

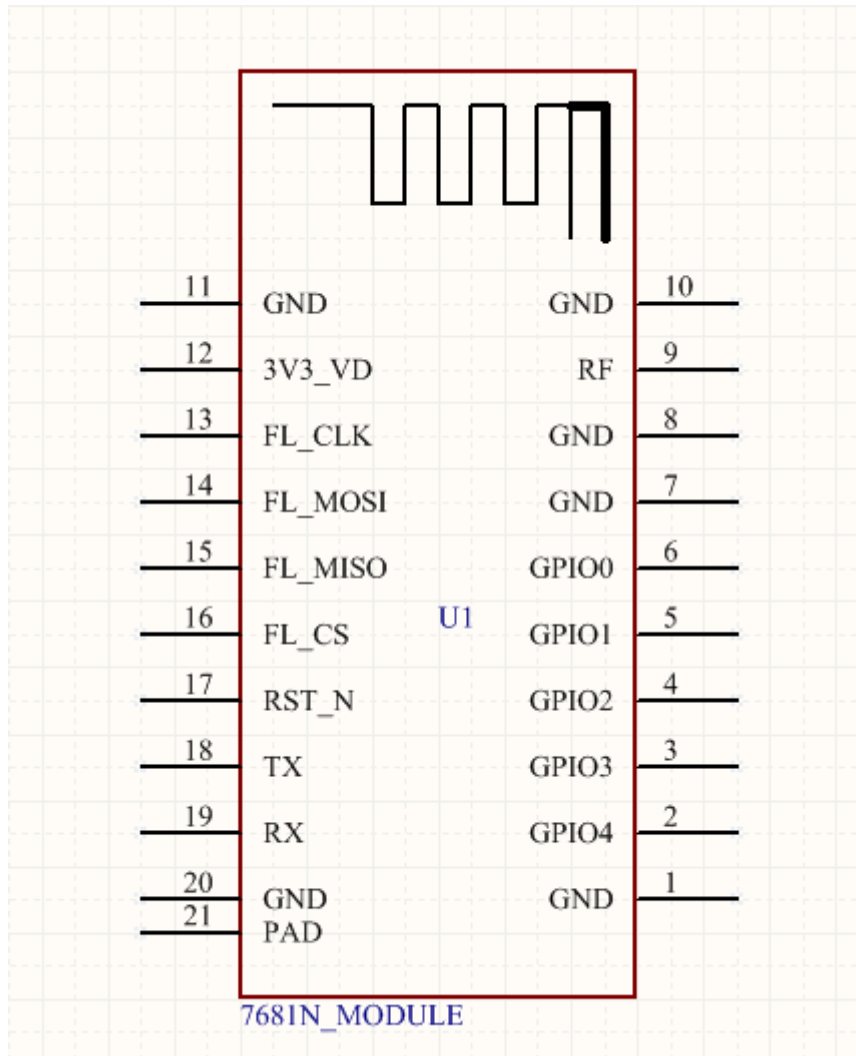
Description	Performance	
	TYP	Unit
Sleep mode	1.1	mA
RX Active, HT40, MCS7	151	mA
RX Power saving, DTIM=1	15	mA
RX Listen	6	mA
TX HT40, MCS7 @15dBm	210	mA
TX CCK, 11Mbps @19dBm	242	mA

Note: All result is measured at the antenna port and VDD33 is 3.3V

Table 4 WLAN 2.4GHz Current Consumption

6. Pin assignments

6.1 Pin Layout

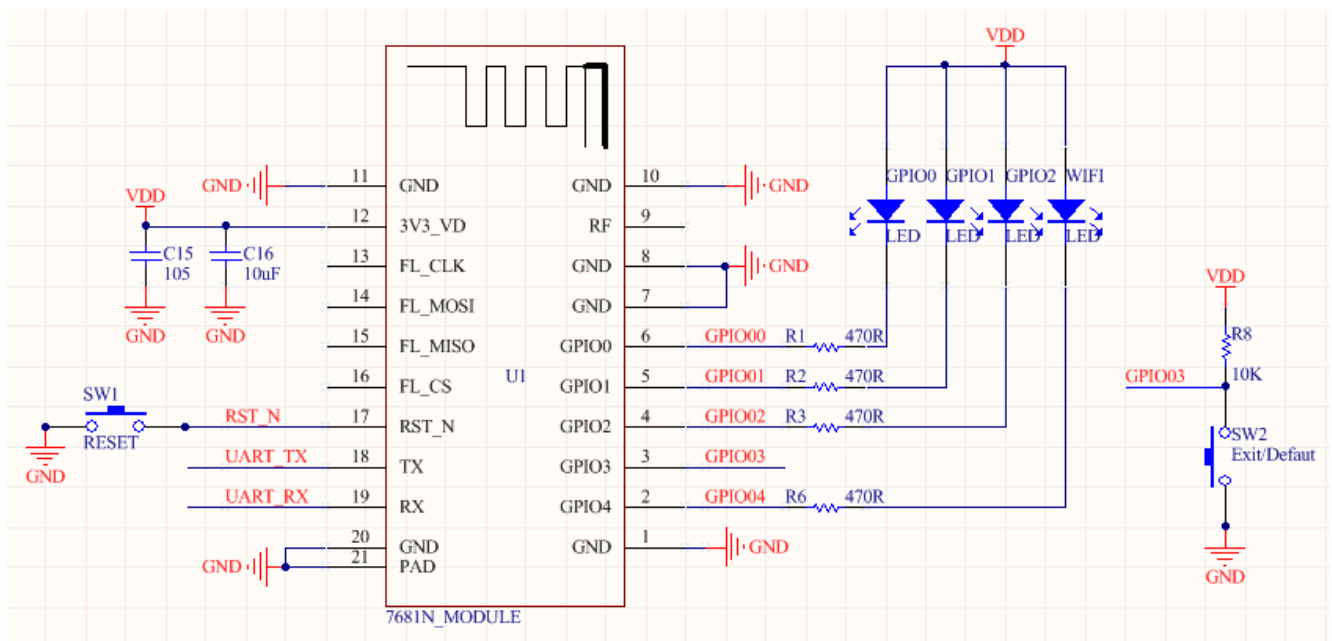


< TOP VIEW >

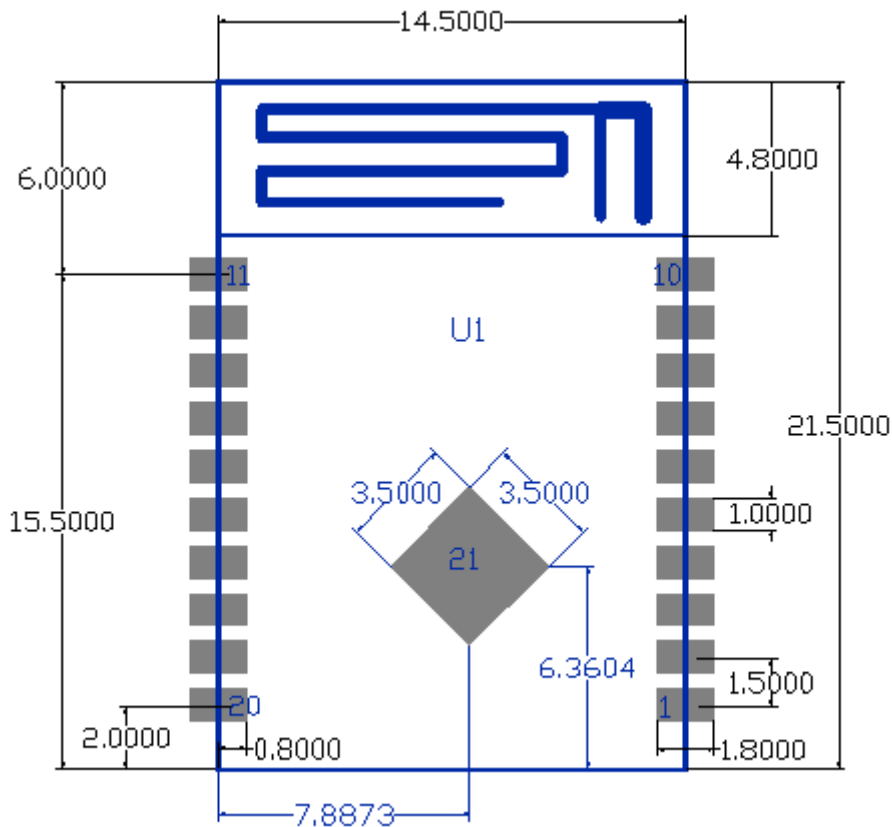
6.2 Pin Definition

NO	Nam	Type	Description
1	GND	-	Ground connections
2	GPIO4	I/O	Programmable input/output
3	GPIO3	I/O	Programmable input/output
4	GPIO2	I/O	Programmable input/output
5	GPIO1	I/O	Programmable input/output
6	GPIO0	I/O	Programmable input/output
7	GND	-	Ground connections
8	GND	-	Ground connections
9	RF_OUT	I/O	RF OUT PI type circuit is required
10	GND	-	Ground connections
11	GND	-	Ground connections
12	3V3VD	P	Power supply 3.3V is required
13	NC	-	reserved
14	NC	-	reserved
15	NC	-	reserved
16	NC	-	reserved
17	RST_N	I	Active-Low Hard Reset
18	UART_TX	O	UART TX
19	UART_RX	I	UART RX
20	GND	-	Ground connections
21	PAD	-	Ground connections

6.3 Application Schematics



6.4 Recommended Footprint (Unit: mm)



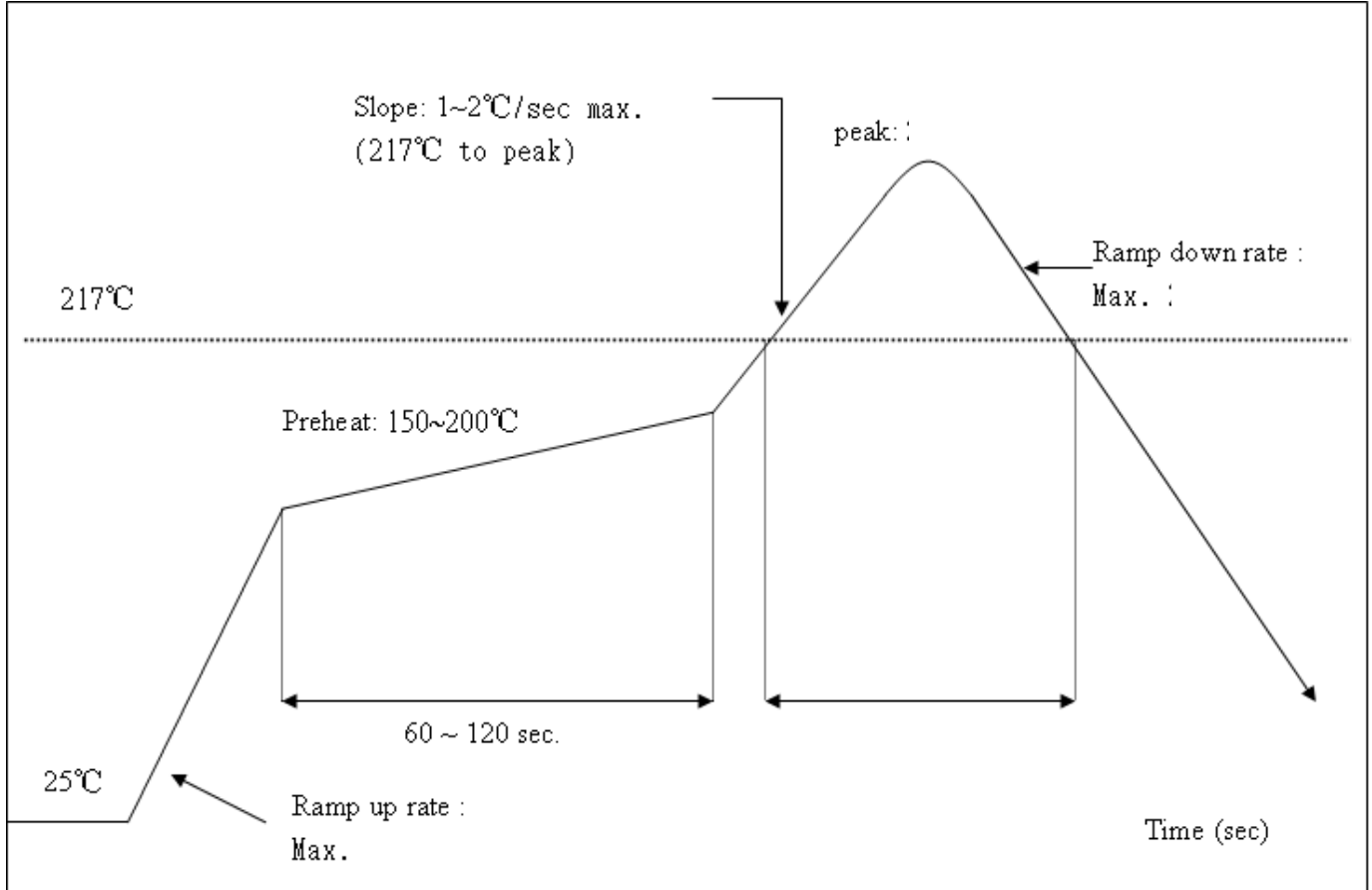
< TOP VIEW >

7. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <math><250^{\circ}\text{C}</math>

Number of Times : ≤ 2 times



ESD CAUTION

The CDT-B176810-00 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDT-B176810-00 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.