Cdtech 中龙通

产 品 承 认 书
SPECIFCATION

版本 Version：V1.0
日期 Date：2015.11.05

名称： WIFI 模块
Name：WIFI Module

型号： CDW-0082660-02
Model：CDW-0082660-02

软件：
Software：

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

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DESIGN：_____　　CHECK：_____　　APPROVAL：_____

更改记录：

Revision History

版本 Version	日期 Date	更改内容 Modification
1.0	2015.11.05	新版发行

1. Introduction

Espressif Systems' Smart Connectivity Platform (ESCP) of high performance wireless SOCs, for mobile platform designers, provides unsurpassed ability to embed Wi-Fi capabilities within other systems,at the lowest cost with the greatest functionality.

2. General Descriptions

The CDW-0082660-00 offers a complete and self-contained Wi-Fi networking solution, allowing it to either host the application or to offload all Wi-Fi networking functions from another application processor. When The CDW-0082660-00 hosts the application, and when it is the only application processor in the device, it is able to boot up directly from an external flash. It has integrated cache to improve the performance of the system in such applications, and to minimize the memory requirements.

Alternately, serving as a Wi-Fi adapter, wireless internet access can be added to any microcontroller-based design with simple connectivity through UART interface or the CPU AHB bridge interface.

The CDW-0082660-00 on-board processing and storage capabilities allow it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. With its high degree of on-chip integration, which includes the antenna switch balun, power management converters, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area.

Sophisticated system-level features include fast sleep/wake context switching for energy- efficient VoIP, adaptive radio biasing for low-power operation, advance signal processing, and spur cancellation and radio co-existence features for common cellular, Bluetooth, DDR, LVDS, LCD interference mitigation.

3. Features

- 802.11 b/g/n protocol
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network

- Integrated PLL, regulators, and power management units
- +19.5dBm output power in 802.11b mode
- Integrated temperature sensor
- Supports antenna diversity
- Power down leakage current of < 10uA
- Integrated low power 32-bit CPU could be used as application processor
- SDIO 2.0, SPI, UART
- STBC, 1×1 MIMO, 2×1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4μs guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

4. Applications

- Smart power plugs
- Home automation
- Mesh network
- Industrial wireless control
- Baby monitors
- IP Cameras
- Sensor networks
- Wearable electronics
- Wi-Fi location-aware devices
- Security ID tags
- Wi-Fi position system beacons

5. Block Diagram

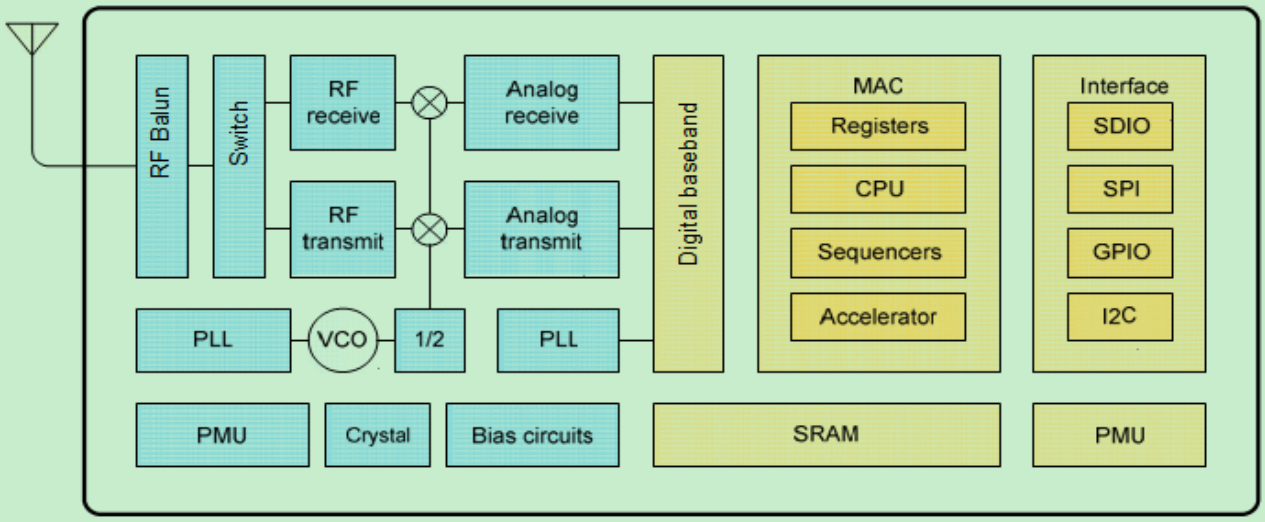


Figure 1: The CDT-N182660-00 Block Diagram

6. General Specification

Category	Parameter	Value
Wi-Fi	Standard	802.11 b/g/n
	Frequency	2.4G-2.5G(2400M-2483.5M)
	Tx Power	802.11 b： 18dBm
		802.11 g ： 15dBm
		802.11 n ： 14dBm
	Rx Sensitivity	802.11 b ： (11Mbps) -86dbm
		802.11 g ： (54Mbps) -72dbm
		802.11 n ： (MCS7) -69dbm
	Antenna	PCB Trace External I-PEX Connector

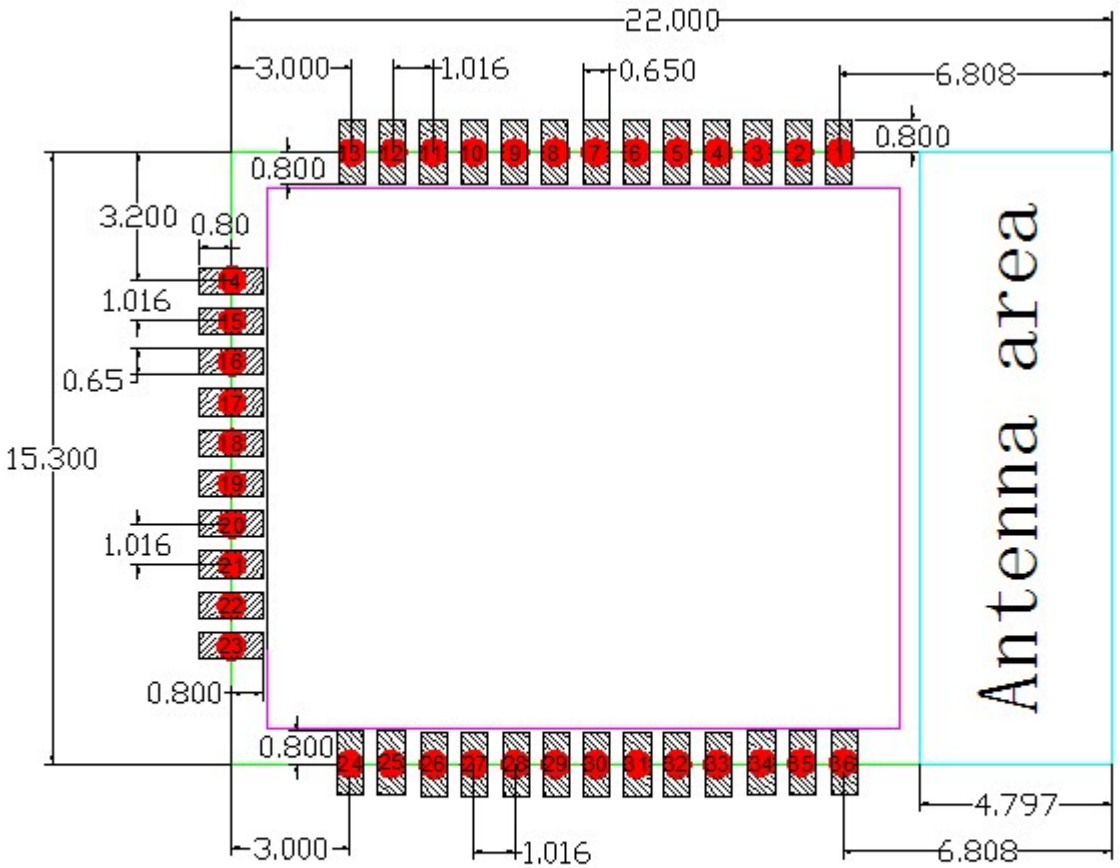
Hardware	Data Interface	UART/I2C/ GPIO/PWM/SPI
	Operating Voltage	3.0~3.6V
	Peak Current	Max.600mA
	Operating	-20 ℃ – 70 ℃
	Storage	-40 ℃ – 85 ℃
	Size	22x15.3x3.0mm
	External Interface	N/A
Software	Wi-Fi Mode	station/softAP/SoftAP+station
	Security	WPA/WPA2
	Encryption	WEP/TKIP/AES
	Firmware Upgrade	UART Flash Download
		Via Cloud Server
	SW Development	Supports Cloud Server Development / SDK for custom
	Network Protocols	IPv4, TCP/UDP/HTTP/FTP
	User Config	AT Instruction Set(loud Server Android/ios App

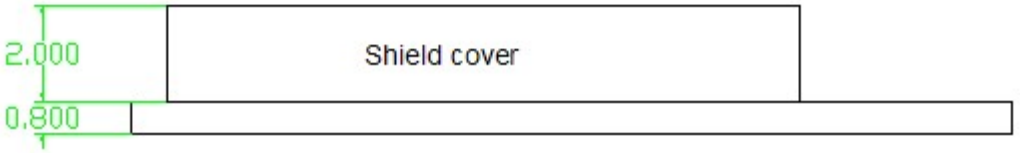
7. Current Consumption

Mode	Min	Typ	Max	Unit
Transmit 802.11b, CCK 11Mbps, P_{OUT}=+17dBm		170		mA
Transmit 802.11g, OFDM 54Mbps, P_{OUT} =+15dBm		140		mA
Transmit 802.11n, MCS7, P_{OUT}=+13dBm		120		mA
Receive 802.11b, packet length=1024 byte, -80dBm		50		mA
Receive 802.11g, packet length=1024 byte, -70dBm		56		mA
Receive 802.11n, packet length=1024 byte, -65dBm		56		mA
Modem-Sleep		15		mA
Light-Sleep		0.9		mA
Deep-Sleep		10		uA
Off		5		uA

1. Modem-Sleep requires the CPU to be working, as in PWM or I2S applications. According to 802.11 standards (like U-APSD), it saves power to shut down the Wi-Fi Modem circuit while maintaining a Wi-Fi connection with no data transmission. E.g. in DTIM3, to maintain a sleep 300ms-wake 3ms cycle to receive AP's Beacon packages, the current is about 15mA
2. During Light-Sleep, the CPU may be suspended in applications like Wi-Fi switch. Without data transmission, the Wi-Fi Modem circuit can be turned off and CPU suspended to save power according to the 802.11 standard (U-APSD). E.g. in DTIM3, to maintain a sleep 300ms-wake 3ms cycle to receive AP's Beacon packages, the current is about 0.9mA
3. Deep-Sleep does not require Wi-Fi connection to be maintained. For application with long time lags between data transmission, e.g. a temperature sensor that checks the temperature every 100s, sleep 300s and waking up to connect to the AP (taking about 0.3~1s), the overall average current is less than 1mA.

8. Dimension & Pin Assignments

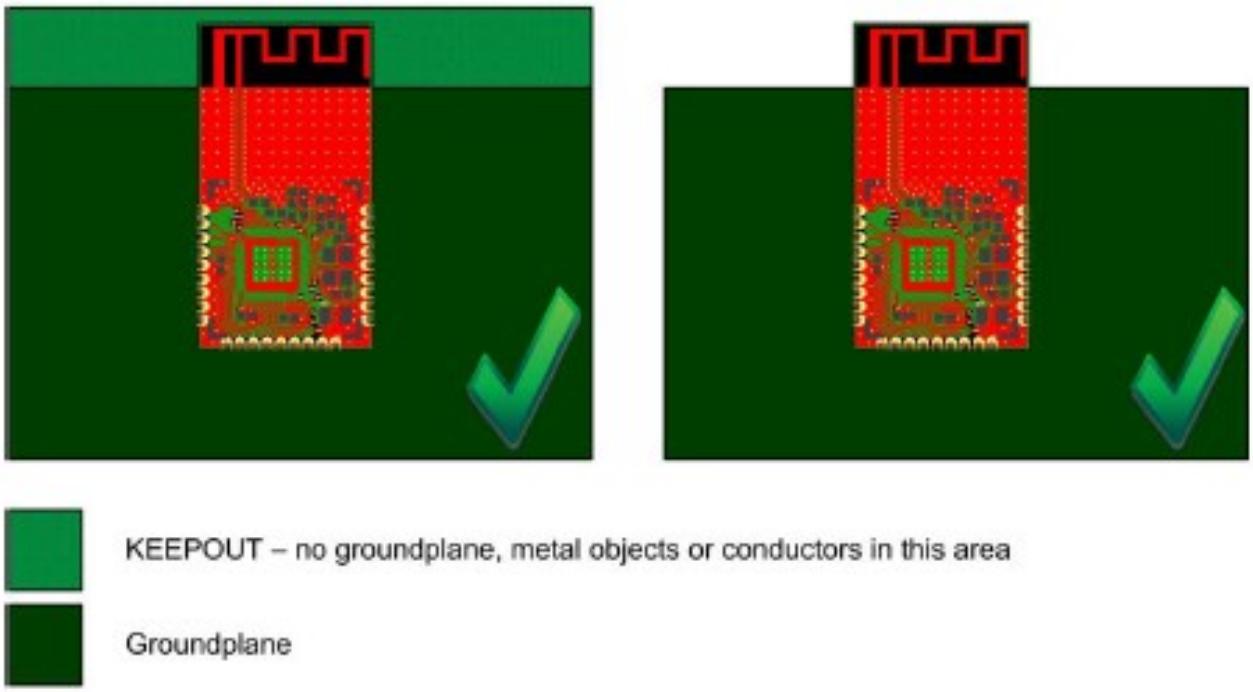


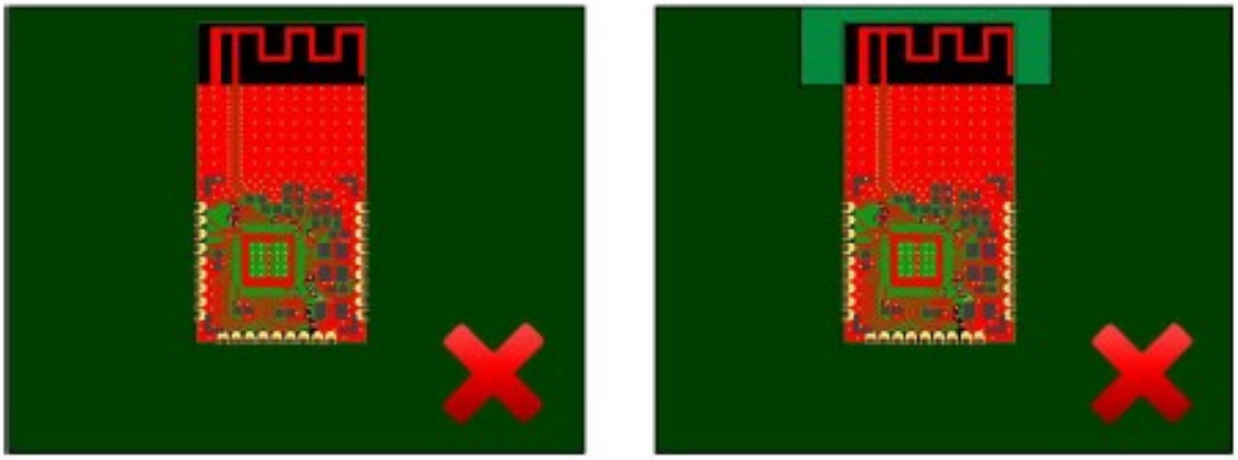


NO	Nam	Description
1	GND	Ground connections
2	GND	Ground connections
3	GPIO12	GPIO12 , HSPI_Q
4	GPIO13	GPIO13 , HSPI_D
5	GPIO16	Deep-Sleep Wake , GPIO16
6	GPIO14	GPIO14 , I2C_SCL , HSPI_CLK
7	GPIO2	GPIO2 , I2C_SDA
8	CHIP_PD	Chip enable, Active h

9	TOUT	10 bit ADC
10	GPIO15	GPIO15 , HSPI_CS
11	GND	Ground connections
12	GND	Ground connections
13	GND	Ground connections
14	GPIO0	GPIO0 , SPI_CS2
15	GPIO4	GPIO4
16	NC	NC
17	GND	Ground connections
18	VDD33	Power supply , 3.3V is required
19	GND	Ground connections
20	SD_D2	Reserved
21	SD_D3	Reserved
22	SD_CMD	Reserved
23	SD_CLK	Reserved
24	SD_D0	Reserved
25	SD_D1	Reserved
26	GND	Ground connections
27	RST	External reset, active low
28	UTXD	UART_TX , GPIO1 , SPI_CS1
29	GPIO5	GPIO5
30	URXD	UART_RX , GPIO3
31	GND	Ground connections
32	GND	Ground connections
33	GND	Ground connections
34	GND	Ground connections
35	RF_OUT	External PI-type circuit is requested
36	GND	Ground connections

9. Optimal PCB placement of the module



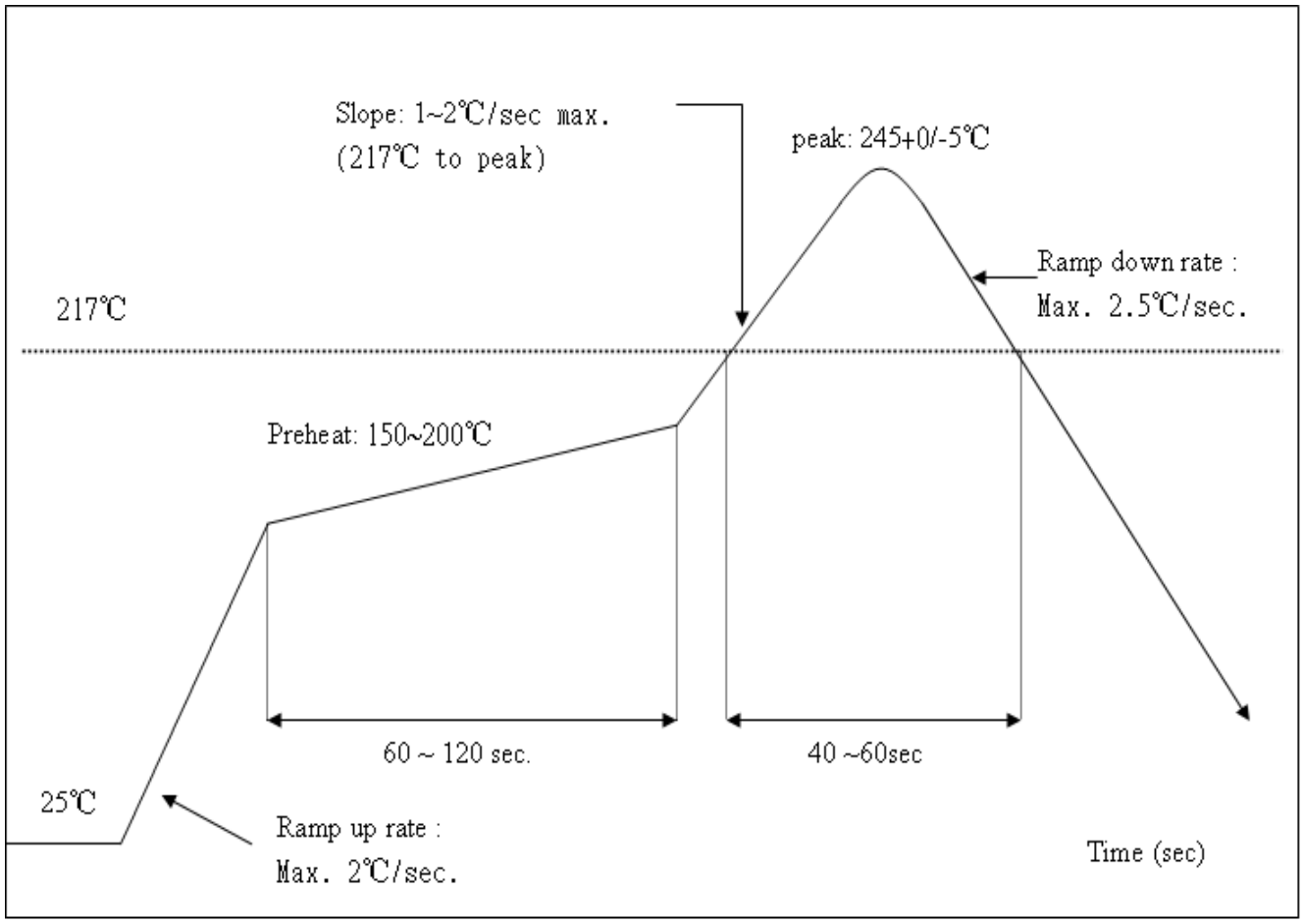


10. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

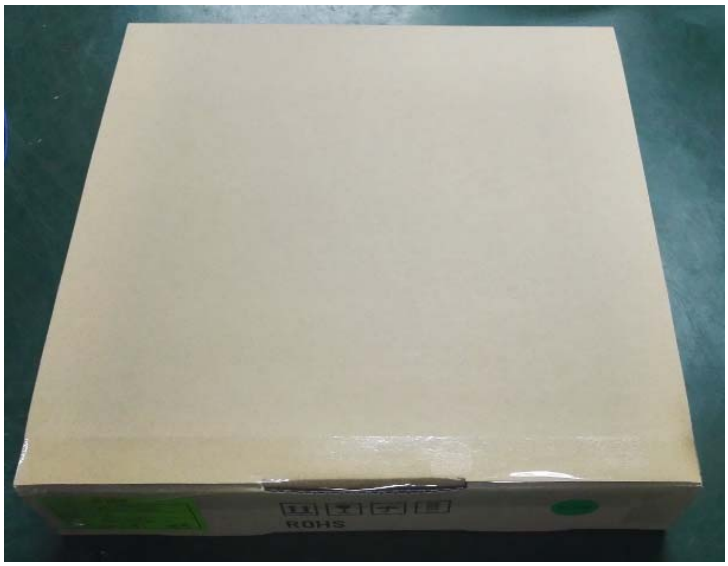
Peak Temperature : <250°C

Number of Times : ≤2 times



8. Packing information

330mm*330mm*30mm
1000PCS/Reel



ESD CAUTION

The CDW-0082660-02 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDW-0082660-02 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.