



MK9653-WIFI module data manual

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Note:

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FCC ID: 2AU9B-B9653

Document release/change instructions

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1. Product description

MK9653 is a WiFi module based on ESP8285H16 control chip developed by Shenzhen Manka IOT Electronics Co., Ltd. ESP8285H16 inherits the industry-leading Tensilica 106 low-power 32-bit MCU, the main frequency supports 80MHz and 160MHz, and supports RTOS; the The module has on-board antenna, low power consumption, low cost, convenient networking and other functions, and leads to UART, IIC, PWM interfaces, which greatly facilitates customers' extended applications.

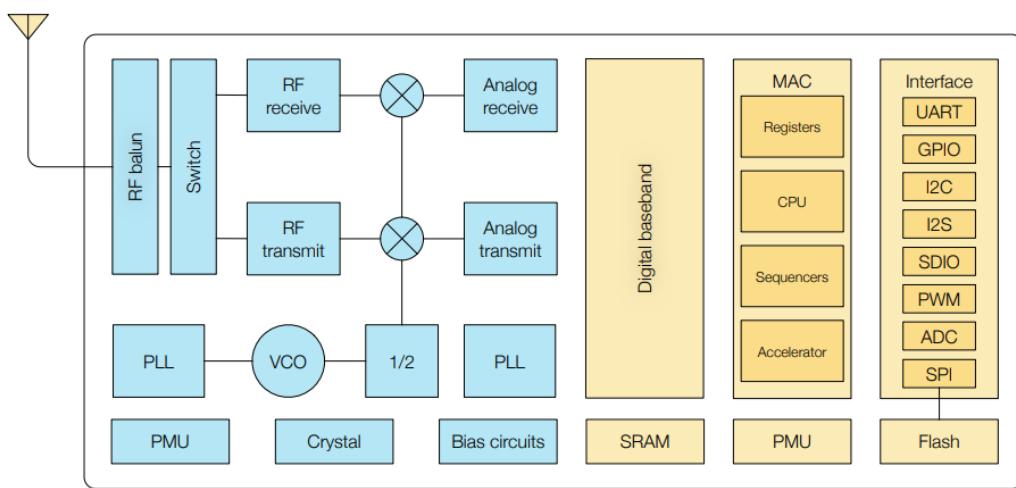


图 3-1. 功能原理图

Application field:

- (1) Smart light control
- (2) Smart socket
- (3) Wireless sensing
- (4) IP camera
- (5) Wearable electronic products

2. Basic parameters

Electrical parameters	Product number	MK9653
	Power supply range	Supply voltage: 2.7V~3.6V, Supply current: $I_{min}>500mA$;
	Frequency Range	2400MHz~2483.5MHz
	Wireless standard	802.11.b/g/n
	Transmit power	802.11.b:+19dBm
		802.11.g:+19dBm(6Mbps)
		802.11.g:+15dBm(54Mbps)
		802.11.n:+19dBm(MCS0)

		802.11.n:+14dBm(MCS7)
Received power	802.11.b:-97dBm(1Mbps)	
	802.11.g:-74dBm(54Mbps)	
	802.11.n:-70dBm(MCS7)	
WiFi mode	Station/SoftAP/SoftAP+Station	
	Operating temperature	-40°C ~ 105°C
Other	Size	24mm*16mm*0.8mm

3. Dimensions and pin definition

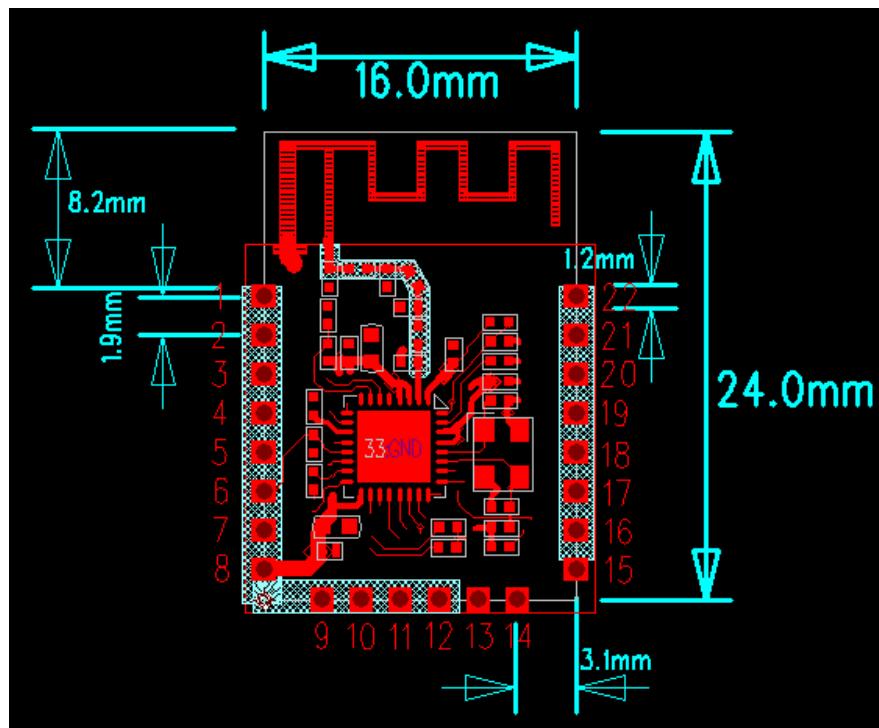


Figure 1 Dimensions and pin diagram

Table 2 Pin definition

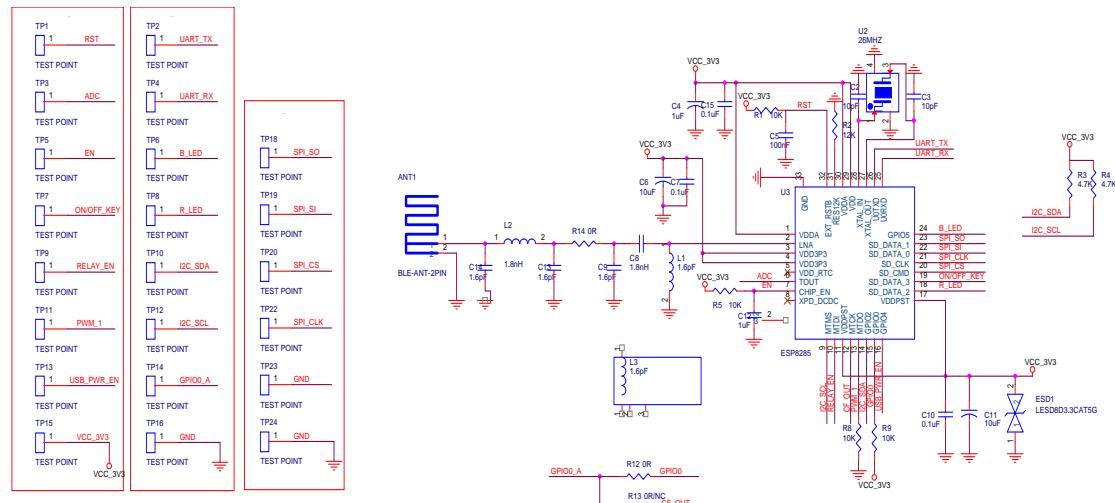
PIN	Symbol	Description
1	RST	Reset pin, low level reset
2	ADC	AD acquisition (10bit, input voltage range 0V~1.0V)
3	EN	Module enable, high level effective
4	GPIO10	GPIO10/SPIWP/HSPIWP
5	PWM0	PWM0/HSPI_MISO/GPIO12
6	PWM1	PWM1/GPIO15/HSPI_CD/UART0_RTS
7	PWM3	PWM3/GPIO4
8	VCC	3.3V
9	SO	SPI_MOSI/GPIO8
10	SI	SPI_MISO/GPIO8
11	CS	SPI_CS0/GPIO11
12	CLK	SPI_CLK/GPIO6
13	GND	Power ground

14	GND	Power ground
15	GND	Power ground
16	GPIO0	GPIO0/SPI_CS2
17	SCL	IIC_CLK/GPIO14
18	SDA	IIC_SDA/UART1_TX/GPIO2
19	GPIO9	GPIO9/PIHD/HSPIHD
20	GPIO5	GPIO5
21	RXD	UART0_RX/GPIO3
22	TXD	UART0_TX/GPIO0/SPI_CS1

4. Electrical parameters

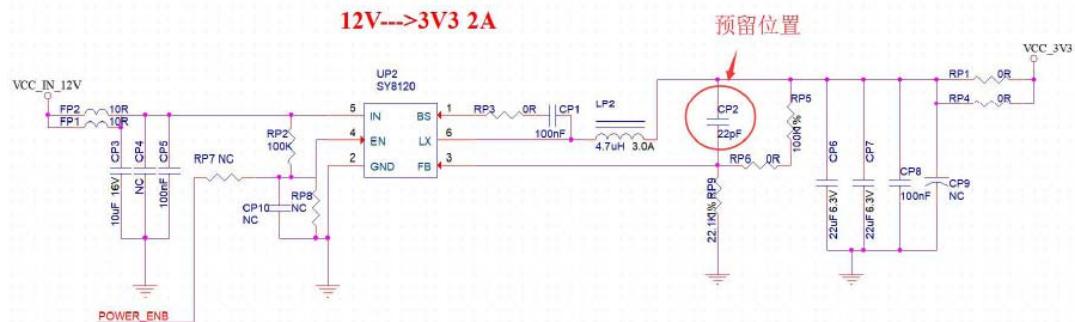
Performance index	Min value	Typical value	Max value	Unit
Supply voltage	2.7	3.3	3.6	V
Supply current	500	—	—	mA
Operating temperature	-40	25	105	°C
Welding temperature	—	—	260	°C

5. Schematic diagram



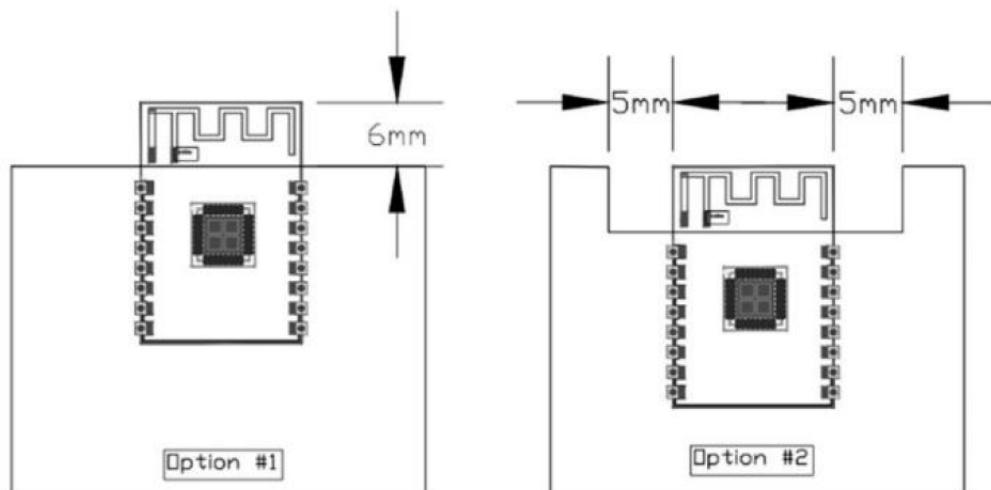
6.Power supply recommendation

- (1) Recommended 3.3V voltage, peak current above 500mA.
- (2) It is recommended to use LDO for power supply; if DC-DC is used, the ripple is recommended to be controlled within 30mV.
- (3) The DC-DC power supply circuit is recommended to reserve the position of the dynamic response capacitor, which can optimize the output ripple when the load changes greatly.
- (4) It is recommended to add ESD devices to the 3.3V power interface.



7.Precautions

- (1) Reverse connection of the positive and negative poles of the power supply is prohibited;
- (2) It is forbidden for the power supply voltage to exceed 2.7V~3.6V;
- (3) Prohibit the case temperature $TC > 105^{\circ}C$;
- (4) The following 2 methods are recommended for the installation position on the motherboard:
 - ① Place the module on the edge of the main board, and the antenna area extends out of the edge of the main board.
 - ② Place the module on the edge of the main board, and hollow out an area at the antenna position on the edge of the main board.
- (5) In order to meet the performance of the on-board antenna, it is forbidden to place metal devices around the antenna, away from high-frequency devices, such as transformers, coils, and relays.



FCC statements:

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes 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.

The device has been evaluated to meet general RF exposure requirement, The device can be used in portable exposure condition without restriction Federal Communication Commission (FCC) Radiation Exposure Statement Power is so low that no RF exposure calculation is needed.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Important Note: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC authorization in the U.S. **OEM Integrators - End Product Labeling Considerations:** This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between

the antenna and users. The final end product must be labeled in a visible area with the following: "Contains, FCC ID: 2AU9B-B9653". The grantee's FCC ID can be used only when all FCC compliance requirements are met. OEM Integrators - End Product Manual Provided to the End User: The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document.