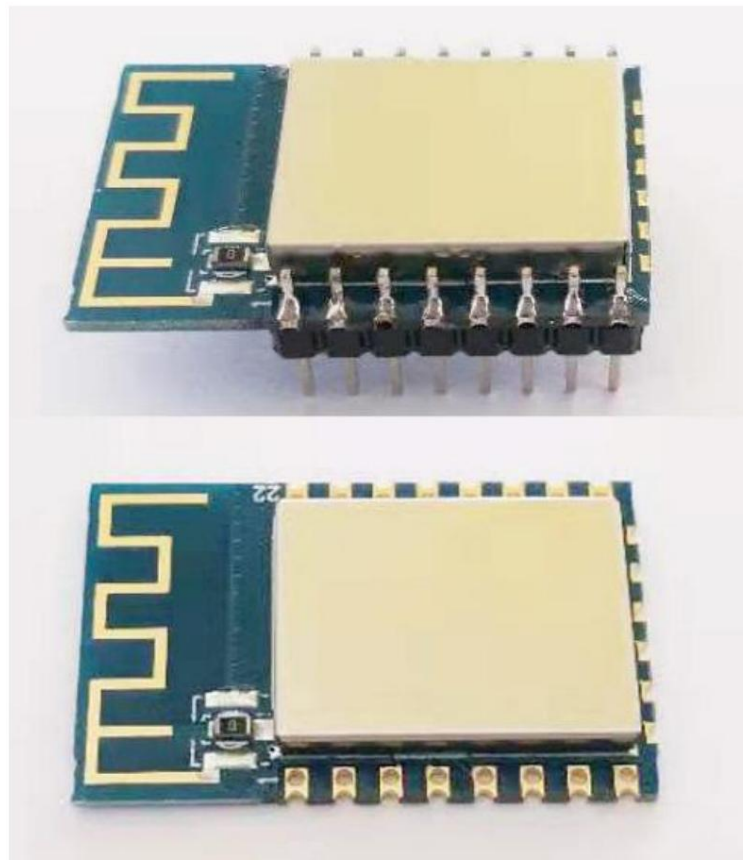




Shenzhen Hailingke Electronics Co., Ltd.

HLK-M20 Datasheet



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1. Product Introduction

• Application: IOT, IPTV, TV, monitoring, etc.

• Integration: Single chip integrating BB/PMIC/RF/PA/Memory/LNA/Balun

• Advantages: lower power consumption, better performance, larger memory

• Specifications:

802.11 b/g/n 150Mbps

2.4GHz

Integrated MCU, 160MHz

Interface (I2C, I2S, 3*UART, 2*SPI, SDIO, 6*hard PWM, 4*ADC, 14*GPIO)

Support FreeRTOS

1.1. HLK-M20 module types

The module hardware type is shown in the figure below:

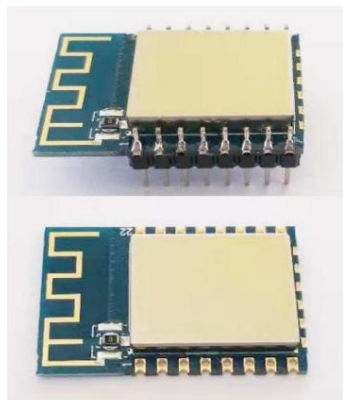


Figure 1: Front view of the pin type and the patch type

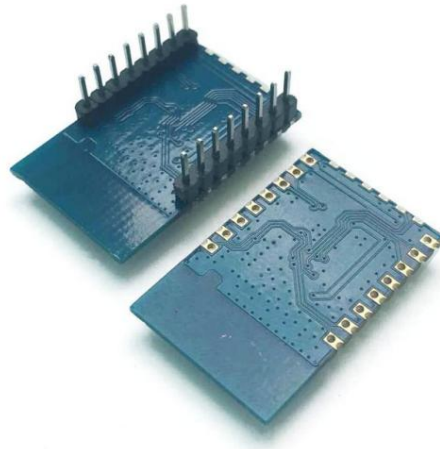


Figure 2 The back of the pin and patch models

1.2. WLAN characteristics

- Single chip integrated MAC/PHY/DMAC
- Support 2.4GHz IEEE 802.11b/g/n
- 20/40MHz bandwidth, maximum 150Mbps
- Supports (WPA)/WPA2/WPA2-Enterprise/Wi-Fi
- Support softAP
- Supports A-MPDU, A-MSDU

1.3. MCU Features

- 32 bits, maximum clock frequency 160MHz
- Built-in 8Mbit flash
- Function pin position is programmable
- Available external rising/falling edge interrupt or wake-up GPIO

2. Functional block diagram

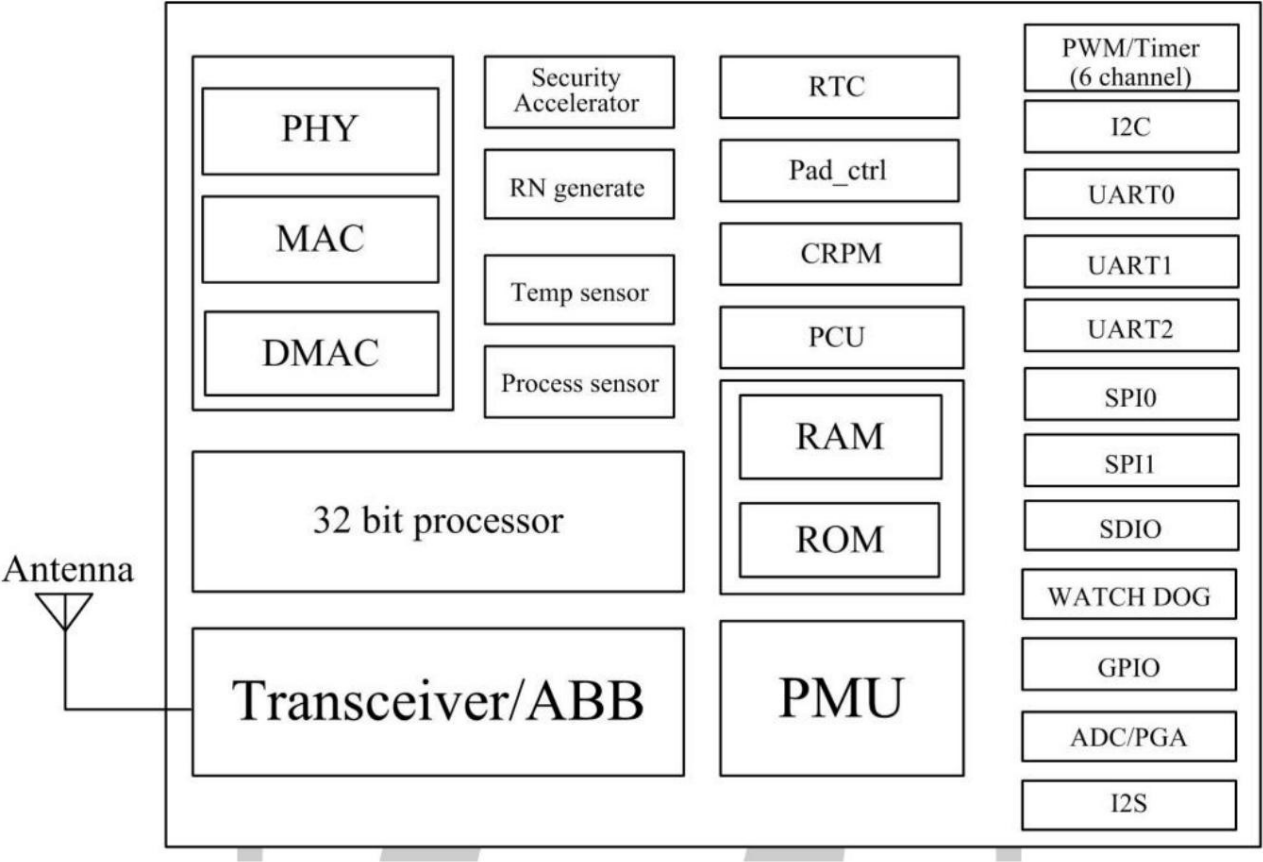


Figure 3 Module functional block diagram

3. Specifications

3.1. System Memory

project		parameter
Memory System	Built-in RAM	User SRAM 128K Bytes
	Built-in Flash	Built-in 8Mbit flash

Table 1 System memory

3.2. Interface

project	parameter
Serial port performance	Supports up to 3 serial ports, baud rate can be configured from 1200bps to 500000bps
I2S Interface Performance	Supports 1 I2S interface; BCLK of I2S host supports 8/32/44.1/48/88.2/96KHz; Support 16/32 bit per channel, data format can be configured as 8/16/20/24/32bit
I2C Interface Performance	Supports an I2C standard interface. Supports master or slave operation
PWM interface performance	supports up to 6 PWM interfaces; PWM period and duty cycle are programmable
SPI interface	As SPI master, supports up to 2 SPI slaves
SDIO	Support 1 SDIO interface

Table 2 System interface introduction

3.3. Power supply

symbol	Function	Minimum voltage (V) Typical	voltage (V) Maximum	voltage (V) Current (mA)	
VBAT	Supply voltage range	3.3	3.3	3.5	~500mA
I/O	I/O input voltage range	1.8	3.3	3.5	~10mA

Table 3 Power supply introduction

4. Module pin definition

4.1. Pin definition diagram

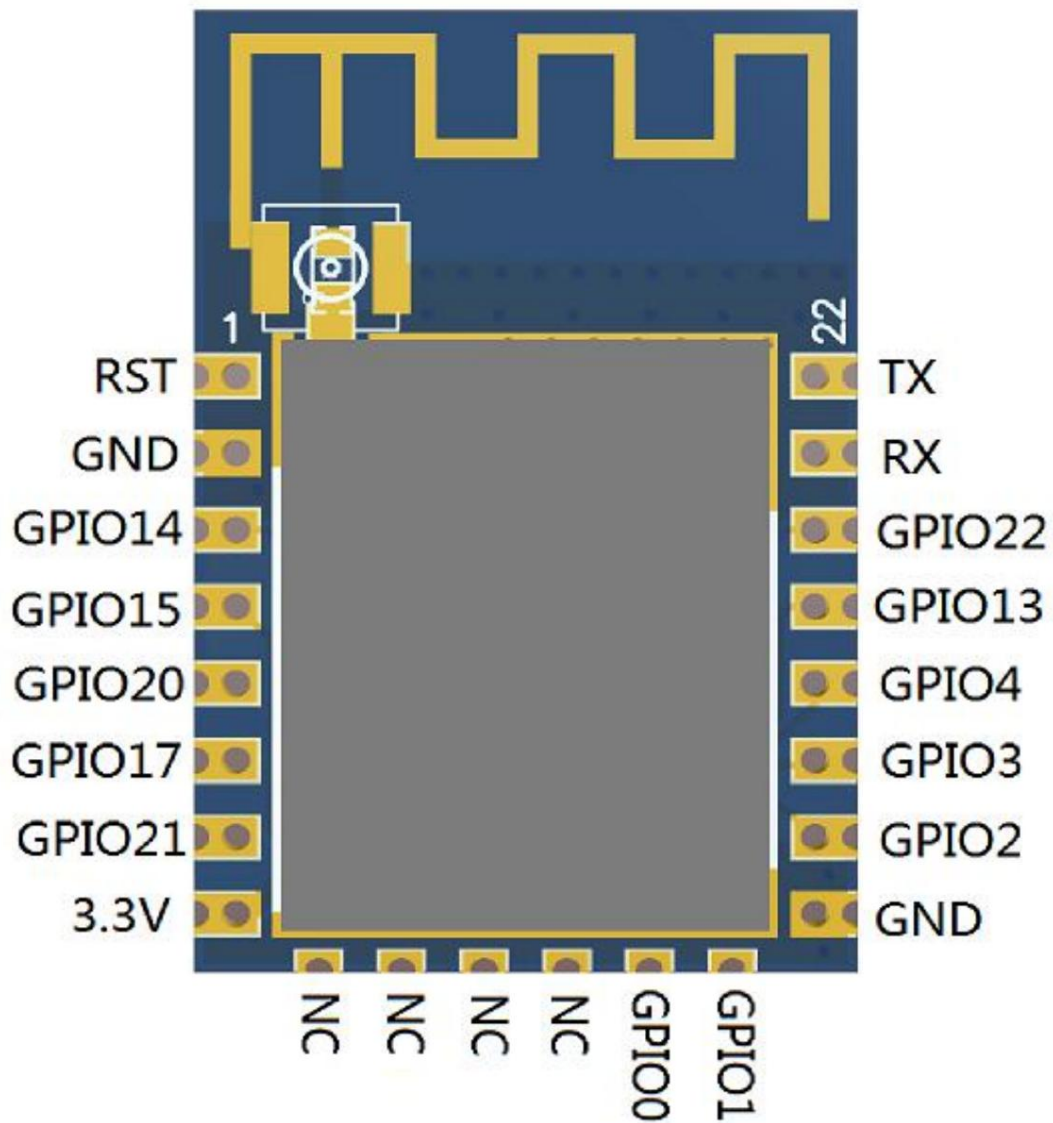


Figure 4 Pin definition diagram

Remark:

¹, the figure shows the default definition, and the reuse function is not listed.

² Please leave the pins unused in the air and do not pull them up or down at will to avoid abnormal startup of the module.

4.2. Pin Description

Pin Number	Pin Name	Type	illustrate
1	RST	I	RESET signal of the chip
2	GND	I/O	buck ground
3	GPIO14	I/O	General purpose input/output
4	GPIO15	I/O	General purpose input/output
5	GPIO20	I/O	General purpose input/output
6	GPIO17	I/O	General purpose input/output
7	GPIO21	I/O	General purpose input/output
8	3.3V	PWR	power supply
9	NC	I/O	
10	NC	I/O	
11	NC	I/O	
12	NC	I/O	
13	GPIO0	I/O	General purpose input/output
14	GPIO1	I/O	General purpose input/output
15	GND	GND	buck ground
16	GPIO2	I/O	General purpose input/output
17	GPIO3	I/O	General purpose input/output
18	GPIO4	I/O	General purpose input/output
19	GPIO13	I/O	General purpose input/output
20	GPIO22	I/O	General purpose input/output
21	RX	I/O	UART_RX
22	TX	I/O	UART_TX

Table 4 Pin Description

Pin type definition:

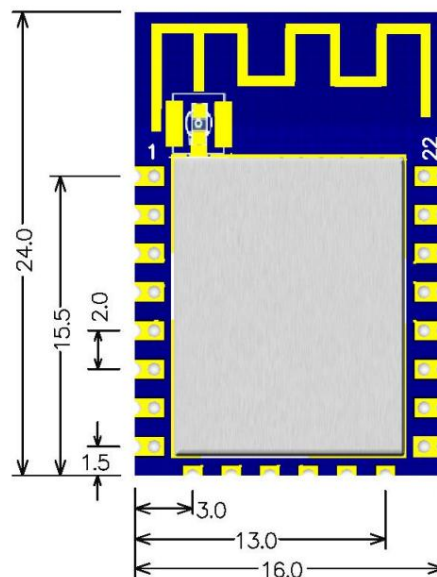
- I/O Digital input/output
- A,I/O Analog input/output
- PWR Power
- GND Ground

4.3. GPIO multiplexing functions and function pin locations

脚位	默认名称	类型	复用		复用		复用		复用		复用		复用		复用		复用	
			名称	类型	名称	类型	名称	类型	名称	类型	名称	类型	名称	类型	名称	类型	名称	类型
1	RESETB	wpu	Reset_B															
2	GND																	
3	GPIO14	I/O	BOOTMODE0	I	GPIO14	I/O	TOUT2	I/O	TOUT2	I/O	PWM_CTRL3	O	ATST_A	Analog	I2S_TXD	I/O	UART2_RXD	I
4	GPIO15	I/O	BOOTMODE1	I	GPIO15	I/O	TOUT3	I/O	TOUT3	I/O	PWM_CTRL5	O	ATST_B	Analog	I2S_TXWS	I/O	UART2_TXD	O
5	GPIO20	I/O	GPIO20	I/O	UART0_RXD	I	I2S_TXWS	I/O	PWM_CTRL0	O	bt_active	I	UART2_RXD					
6	GPIO17		WAKEUP	I	LINK LIGHT		GPIO17											
7	GPIO21	I/O	GPIO21	I/O	UART0_TXD	O	I2S_TXSCK	I/O	PWM_CTRL1	O	bt_priority	I	UART2_TXD	I				
8	3.3v																	
9	NC																	
10	NC																	
11	NC																	
12	NC																	
13	GPIO0	I/O	TCK	wp	GPIO0	I/O	UART0_DTR	O	SPI0_CLK	I	PWM_CTRL0	O	UART0_RXD	I/O	I2S_TXSCK	I/O	I2C_SCL	I
14	GPIO1	I/O	TMS	wp	GPIO1	I/O	UART0_DSR	I	SPI0_CS0	O	PWM_CTRL1	O	bt_active	I	I2S_RXD	I/O	I2C_SDA	O
15	GND																	
16	GPIO2	I/O	TDO	wp	GPIO2	I/O	UART1_RXD	I	SPI0_MOSI	O	PWM_CTRL2	O	bt_priority	I	I2S_RXWS	I/O	UART2_RXD	I
17	GPIO3	I/O	TDI	wp	GPIO3	I/O	UART1_TXD	O	SPI0_MISO	I	PWM_CTRL3	O	w_active	O	I2S_RXSCK	I/O	UART2_TXD	I
18	GPIO4	I/O	TRST	wp	GPIO4	I/O	SPI0_CLK	O	SPI0_CS1	O	PWM_CTRL4	O	w_priority	O	I2S_MCLK	I/O		
19	GPIO13	I/O	WAKEUP	wp	GPIO13	I/O	I2S_TXD	I/O	SPI0_MISO	I/O	PWM_CTRL5	O	32K_CLK_OUT	O	phy_entrx	O		
20	GPIO22	I/O	GPIO22	I/O	UART1_RXD	I	I2S_RXD	I/O	PWM_CTRL2	O	w_active	O	UART2_RXD	O				
21	UART0_RXD	wpu	UART0_RXD	I	GPIO5	I/O	SPI0_CS0	I	UART1_CTS	I/O	SPI0_HOLD	TRI	40M_CLK_OUT	O				
22	UART0_TXD	wpu	UART0_TXD	O	GPIO6	I/O	SPI0_MOSI	O	MSPI_CS1	O	SPI0_WP	TRI	COLD_RESET	O				

Table 5 Pin multiplexing description

5. Module size diagram



Unit: millimeter (mm)

Figure 5 Module size diagram

6. Typical application circuit

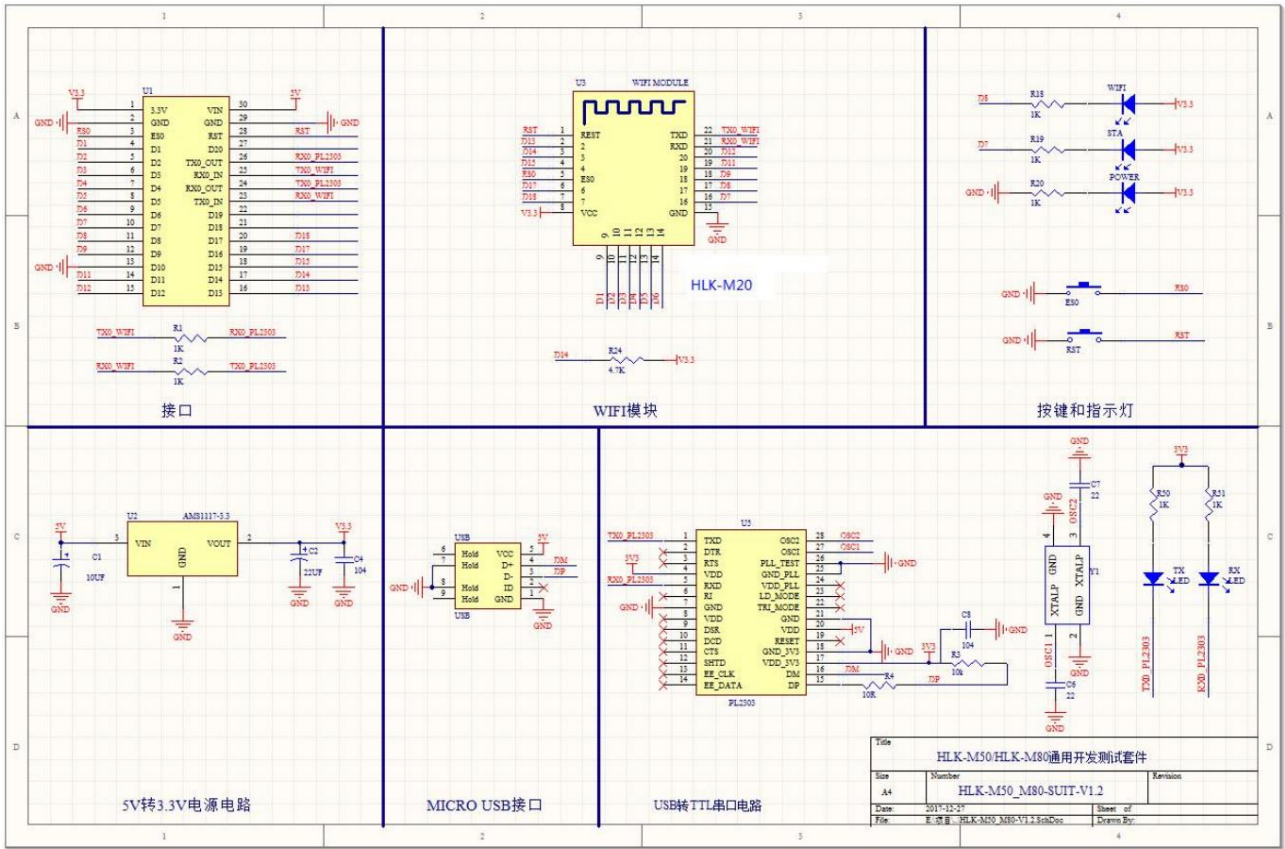


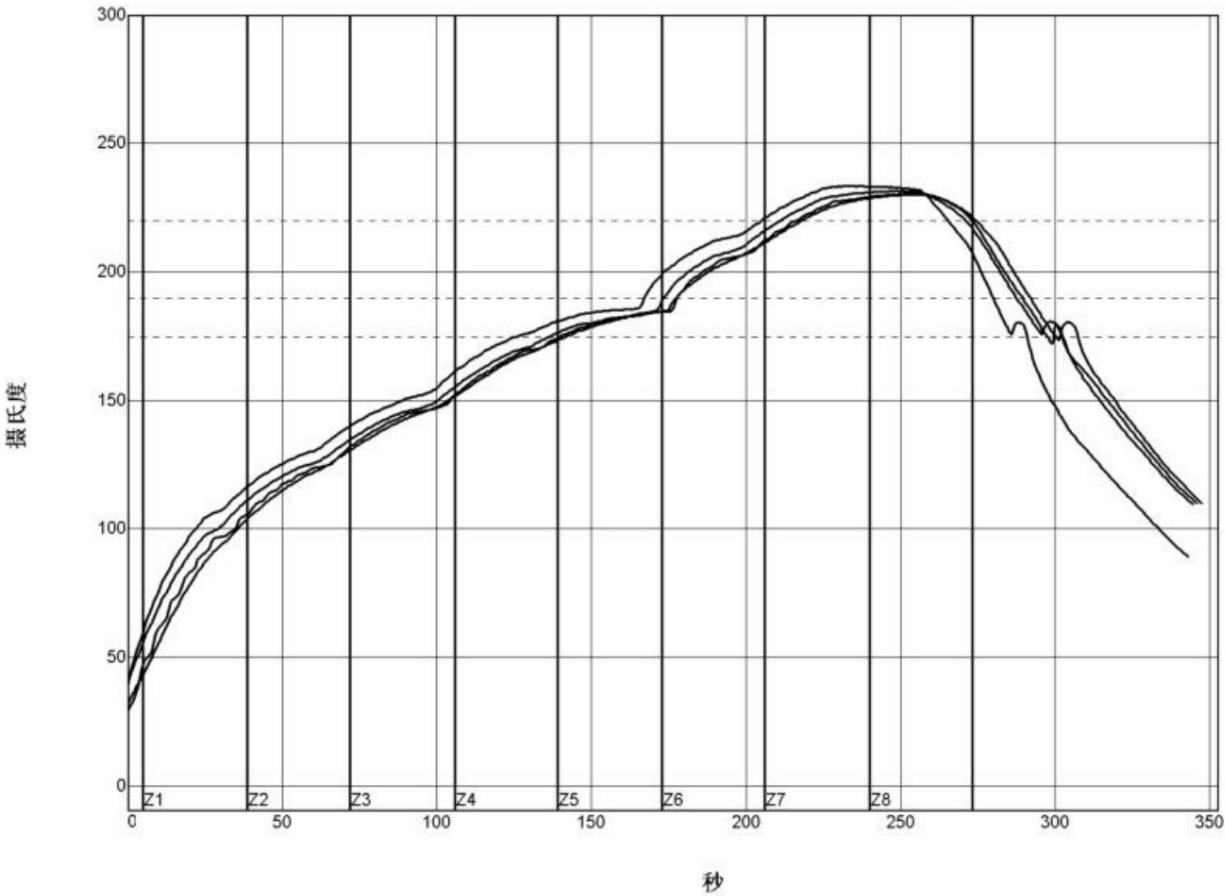
Figure 6 Schematic diagram of the test baseboard

Remark: This is M20 Develop the schematics for the test suite. The schematics and PCB Please ask the salesperson for the source file.

7. Recommended reflow temperature

When the module goes through the oven for the second time, please strictly follow this temperature curve. Too much deviation in reflow temperature will cause damage to the module!

Temperature setting (Celsius)								
Temperature Zone 1	2	3	4	5	6	7	8	
Shangon District 125	135	155	185	195	225	240	230	
Lower temperature zone 125	135	155	185	195	225	240	230	
Conveyor belt speed: 70.0 cm/min								



PWt= 94%	恒温时间175至190C		回流时间 /220C		最高温度	
<TC2>	35.53	-82%	55.58	-72%	230.28	-94%
<TC3>	37.66	-74%	58.66	-57%	230.56	-89%
<TC4>	41.52	-62%	60.63	-47%	233.62	-28%
<TC5>	37.07	-76%	60.44	-48%	231.67	-67%
温差	5.99		5.05		3.34	

制程界限:

锡膏: System Default for Reflow			
统计数名称	最低界限	最高界限	单位
恒温时间175-190摄氏度	30	90	秒
回流以上时间 - 220摄氏度	50	90	秒
最高温度	230	240	度 摄氏度

8. Revision History

date	Version	Modifications
2020/4/13	1.0 Initial version	