Shenzhen Hi-Link Electronic Co.,Ltd

HLK-7688A user manual

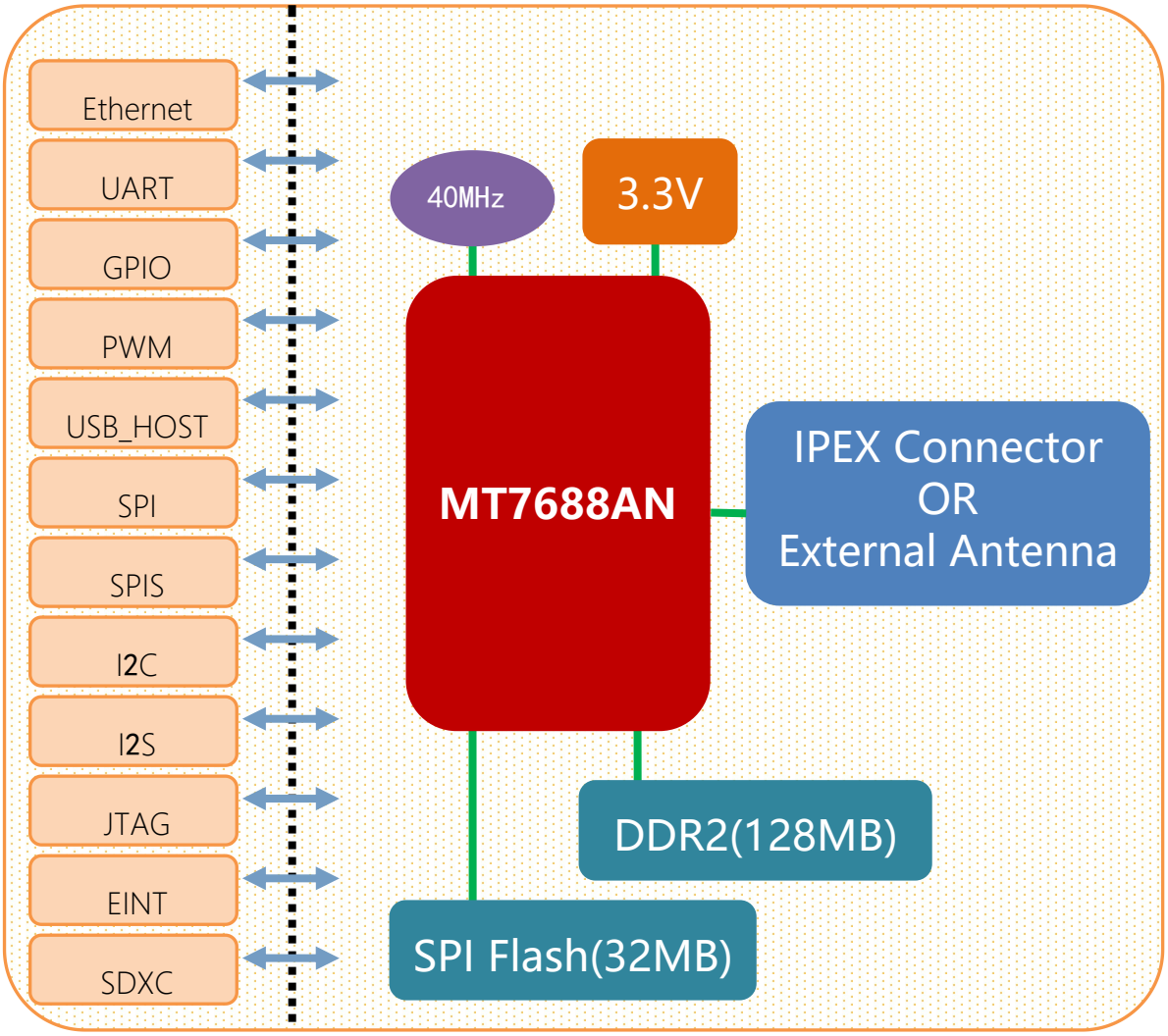
1.INTRODUCTION

HLK-MT7688A based on MT7688AN is a low cost and low power consumption IOT module developed by Hi-Link.The module supports Linux, OpenWRT operating system and custom development. It could be widely applied to smart devices or cloud services application with its rich interface and powerful processors.

1.1. BASIC PARAMETERS

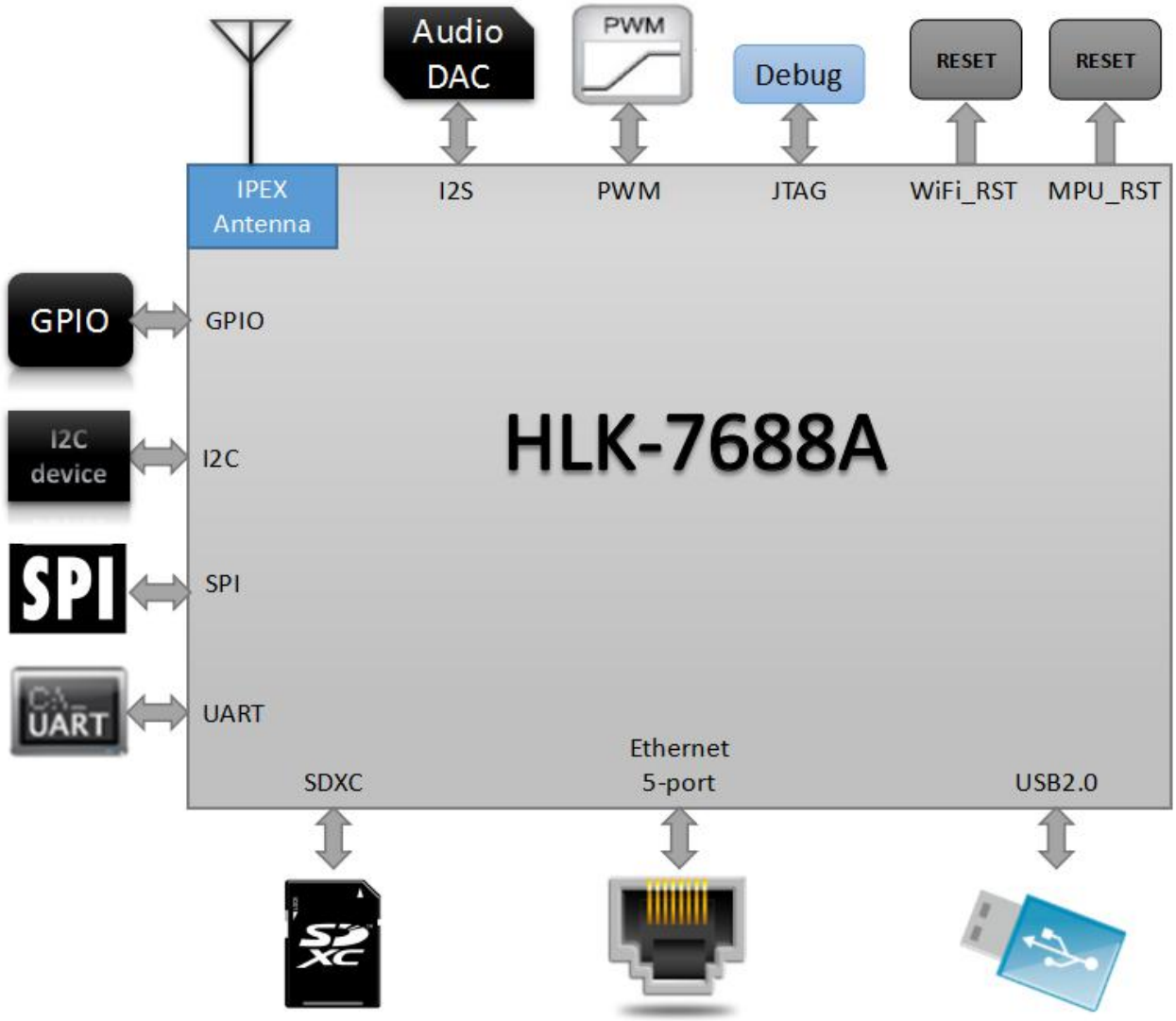
- High data processing ability，MCU frequency 580MHz
- 150M Mbps
- Support 802.11b/g/n
- 20/40 Channel bandwidth
- Support 802.11v
- Support AP,STA and AP,STA mixed
- Five 10/100M ETH PORT
- 1 USB2.0 Host interface port
- Interface SPI/SD-XC/eMMC
- Rich peripheral interfaces，SPI,I2C,I2S,PCM,UART,JTAG,GPIO
- Widely used in IOT
- Inbuilt powerful PMU
- Support 16 Multiple BSSID
- Support multiple security methods WEP64/128, TKIP, AES, WPA, WPA2, WAPI
- Support QoS，WMM，WMM-PS
- Support Linux 2.6.36 SDK，OpenWrt 3.10

2. Diagram



HLK-7688 structure

2.1. Typical application



HLK-7688A typical peripheral interfaces

2.2. Specification

Item	Parameter
Model	HLK-7688A
Chipset	MT7688AN
Kernel	MIPS24KEc
Basic frequency	580MHz
RAM	DDR2 128MB
Flash	32MB
Temperature	Environmental temperature：-20℃~55℃
Humidity	working：0~85%（noncondensing） Storage： 0~85%（noncondensing）
Size	18mm×32.8mm×2.8mm

3. ELECTRONICAL CHARACTERISTICS

3.1. Input voltage

Item	Function	MIN Voltage (V)	Typical voltage (V)	Max voltage (V)
VBAT	Power voltage	3	3.3	3.6

I/O	I/O voltage	3	3.3	3.6

3.2. RF PERFORMANCE

3.2.1. 802.11b 11M

802.11b Transmit (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	
Tx Power Level	DQPSK	18	20	22	dBm
Frequency Tolerance		-15	0	15	ppm
Spectral Mask	11MHz→22MHz		40		dBr
	＞22MHz		53		dBr
Modulation Accuracy	All Data Rate		15		%
802.11b Receiver (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	
Min. Input	11Mbps PER<8%	-91.5	-89.5	-87.5	dBm

3.2.2. 802.11g 54M

802.11g Transmit (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	
Tx Power Level	OFDM	15	17	19	dBm
Frequency Tolerance		-15	0	15	ppm
Modulation Accuracy	All Data Rate		-31	-28	%
802.11g Receiver (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	

Min. Input	54Mbps PER<10%	-78.0	-76.0	-74.0	dBm

3.2.3. 802.11n MCS7(HT20)

802.11n_HT20 Transmit (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	
Tx Power Level	OFDM	15	17	19	dBm
Frequency Tolerance		-15	0	15	ppm
Modulation Accuracy	All Data Rate		-31	-28	dB
802.11n_HT20 Receiver (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit
Frequency Range		Channel 1		Channel 13	
Min. Input	MCS7 PER<10%	-76.5	-74.5	-72.5	dBm

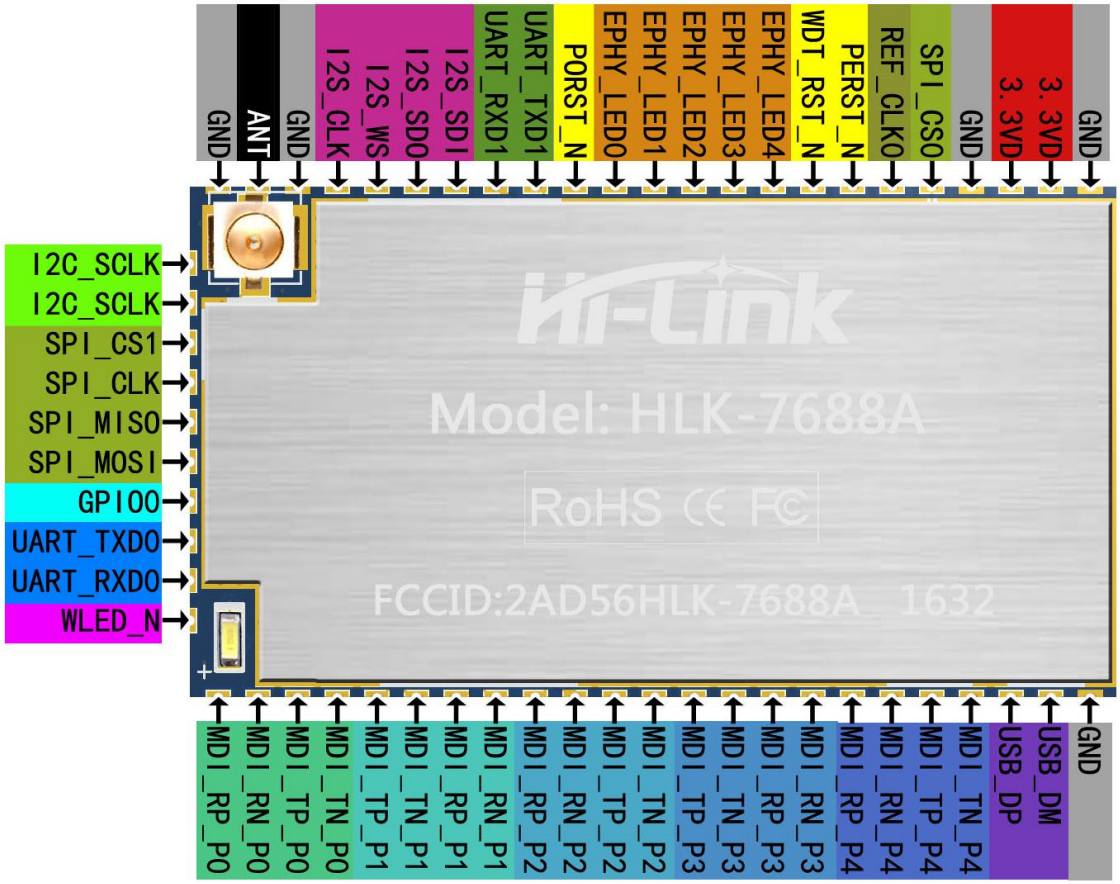
3.2.4. 802.11n_MCS7(HT40)

802.11n_HT40 Transmit (Conductive)					
项目	条件	最小	典型值	最大	单位
Frequency Range		Channel 1		Channel 13	
Tx Power Level	OFDM	15.0	17.0	19.0	dBm
Frequency Tolerance		-15	0	15	ppm
Modulation Accuracy	All Data Rate		-31	-28	dB
802.11n_HT40 Receiver (Conductive)					
Item	Condition	Min.	Typ.	Max.	Unit

Frequency Range		Channel 1		Channel 13	
Min. Input	MCS7 PER<10%	-76.5	-74.5	-72.5	dBm

4. MODULE PINS DEFINITION

4.1. DEFAULT PINS DEFINITION



HLK-7688A default definition

4.2. DEGAULT PINS DEFINITION

PIN	Name (function 1)	Function 2	Function 3	Function 4	GPIO	Note
1	GND					
2	3.3VD					
3	3.3VD					
4	GND					
5	SPI_CS0					
6	REF_CLK0				GPIO38	33333333333333333333333333333333Time output
7	PERST_N				GPIO36	PCIe device reset
8	WDT_RST_N				GPIO37	
9	EPHY_LED4	JTAG_RST_N			GPIO39	
10	EPHY_LED3	JTAG_CLK			GPIO40	
11	EPHY_LED2	JTAG_TMS			GPIO41	
12	EPHY_LED1	JTAG_TDI			GPIO42	
13	EPHY_LED0	JTAG_TDO			GPIO43	
14	PORST_N					Reset
15	UART_TXD1			PWM_CH0	GPIO45	
16	UART_RXD1			PWM_CH1	GPIO46	
17	I2S_SDI	PCMDRX			GPIO0	
18	I2S_SDO	PCMDTX			GPIO1	
19	I2S_WS	PCMCLK			GPIO2	
20	I2S_CLK	PCMFS			GPIO3	
21	GND					
22	ANT					
23	GND					
24	I2C_SCLK				GPIO4	
25	I2C_SD				GPIO5	
26	SPI_CS1				GPIO6	
27	SPI_CLK				GPIO7	

28	SPI_MISO				GPIO9	
29	SPI_MOSI				GPIO8	
30	GPIO0				GPIO11	
31	UART_TXD0				GPIO12	
32	UART_RXD0				GPIO13	
33	WLED_N				GPIO44	WiFi LED
34	MDI_RP_P0				GPIO24	
35	MDI_RN_P0				GPIO23	
36	MDI_TP_P0				GPIO22	
37	MDI_TN_P0				GPIO21	
38	MDI_TP_P1	SPIS_CS		PWM_CH0	GPIO14	
39	MDI_TN_P1	SPIS_CLK		PWM_CH1	GPIO15	
40	MDI_RP_P1	SPIS_MISO		UART_TXD2	GPIO16	
41	MDI_RN_P1	SPI_MOSI		UART_RXD2	GPIO17	
42	MDI_RP_P2		eMMC_D7	PWM_CH0	GPIO18	
43	MDI_RN_P2		eMMC_D6	PWM_CH1	GPIO19	
44	MDI_TP_P2	UART_TXD2	eMMC_D5	PWM_CH2	GPIO20	
45	MDI_TN_P2	UART_RXD2	eMMC_D4	PWM_CH3	GPIO21	
46	MDI_TP_P3	SD_WP	eMMC_WP		GPIO22	
47	MDI_TN_P3	SD_CD	eMMC_CD		GPIO23	
48	MDI_RP_P3	SD_D1	eMMC_D1		GPIO24	
49	MDI_RN_P3	SD_D0	eMMC_D0		GPIO25	
50	MDI_RP_P4	SD_CLK	eMMC_CLK		GPIO26	
51	MDI_RN_P4	SD_CMD	eMMC_CMD		GPIO28	
52	MDI_TP_P4	SD_D3	eMMC_D3		GPIO29	
53	MDI_TN_P4	SD_D2	eMMC_D2		GPIO27	
54	USB_DP					
55	USB_DM					
56	GND					

Note ：

1，All pins are Default function 1.

5. DIMENSIONS