RAK5260 (Double 720P) Video Module Specification V1.0

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Contents

1 Introduction

1.1 Module Introduction

RAK5260 is a low-power, two-channel 720P intelligent video module which completely supports IEEE802.11a/b/g/n wireless protocol. Being small-package and easy to use, it also integrates video image capture, coding, compression and transmission. The definition and fluency of videos is guaranteed by its high-efficient hard coding and powerful WIFI communication modules. The videos can be displayed on intelligent terminals such as Android and iPhone devices. In addition, it contains the transparent serial port design.

RAK5260 intelligent video module has powerful NAT and firewall traversal technology so that the monitor areas can be observed by mobile anywhere anytime. It's stable, super low-power and flexible to use and it can meet the demands of various clients. The technical support provided can make it easy to master and shorten the cycle of R&D; a variety of custom services are also available.

1.2 Application Fields

- Robots
- Household electrical appliances
- Intelligent surveillance
- Intelligent toys
- Building automation
- Logistics and freight management
- Unmanned aerial vehicles
- Home security and automation

1.3 Product Features

- High-power WiFi
  - Support 802.11a/b/g/n protocols
  - Support STA/Soft AP networks
  - Support various security authentication mechanisms: WEP64/WEP128/ TKIP/CCMP(AES)/ WEP/WPA-PSK/WPA2-PSK
  - Support various network protocols: TCP/UDP/ICMP/DHCP/DNS/HTTP

- Video coding
  - Support H.264/VGA/QVGA/RTSP Stream
  - Video coding up to 720P@30fps
  - Separate H.264 + Audio Stream

- Peripheral Extension
  - One-channel independent transparent serial port

1.4 Specification

Parameter	Description
Video Parameter	720P(1280*720) @30FPS video recording+720P(1280*720) @25FPS transmission; 720P(1280*720) @30FPS video recording+960*576@30FPS transmission; 720P(1280*720) @30FPS video recording+VGA(640*480) @30FPS transmission;
Video Delay	iOS mobile phone: about 200-300ms. Average delay of Android mobile phone: 300ms
Camera Pixel	1 mega pixels
Mobile Phone APP	Provide SDK for self-developed UI, Android & iOS，
Transmission Distance	Effective distance: 150m, relatively define and fluent distance: 120m
Size Parameter	60.20mm*30.18mm
Baud Rate of Transparent Serial Port	115200bps (Default), can be altered by commands
Wireless Parameter	5.8G WiFi，Support 802.11a/b/g/n protocol and STA/Soft AP networks
Power Parameter	5V power working current 500mA；

2 Hardware Descriptions

2.1 Module View

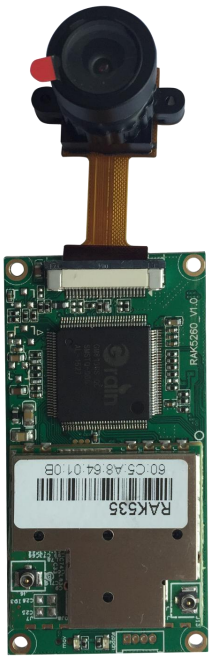


Image 2-1 Front side of module

Image 2-2 Back side of module

2.2 Module Size

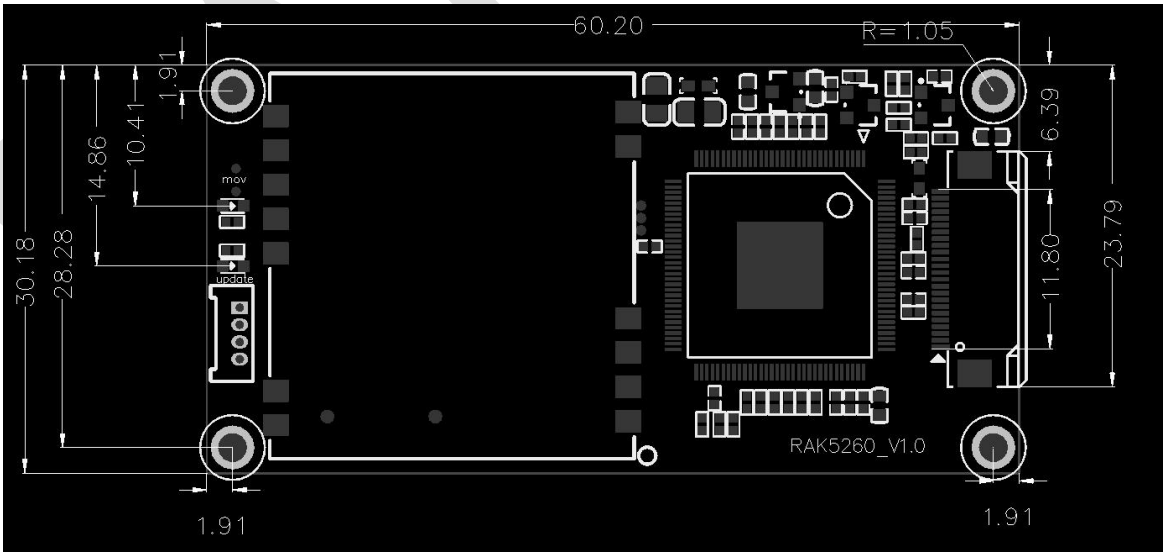


Image 2-3 Size chart of module pin (front side)

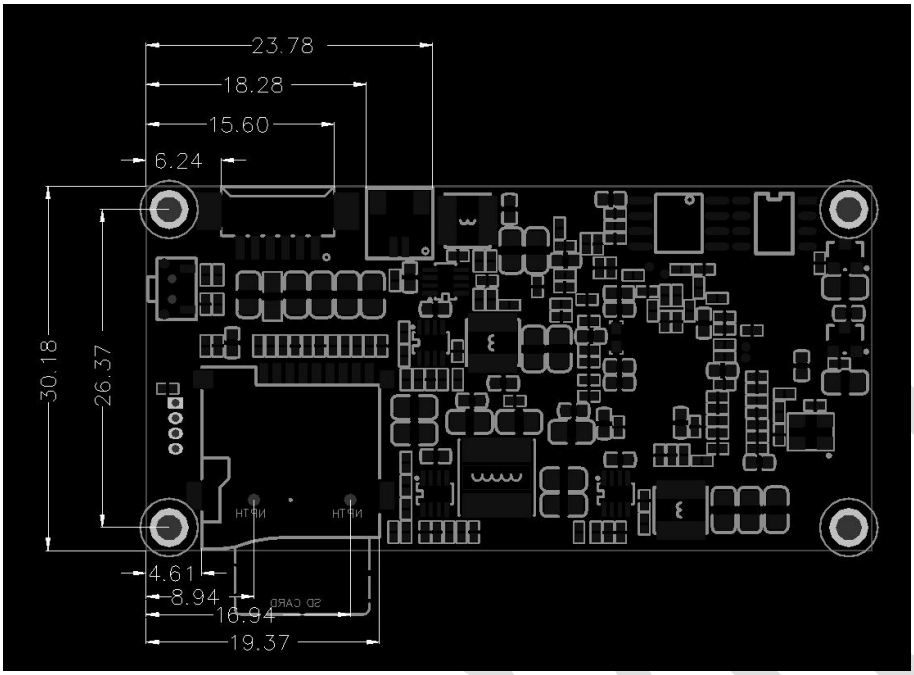
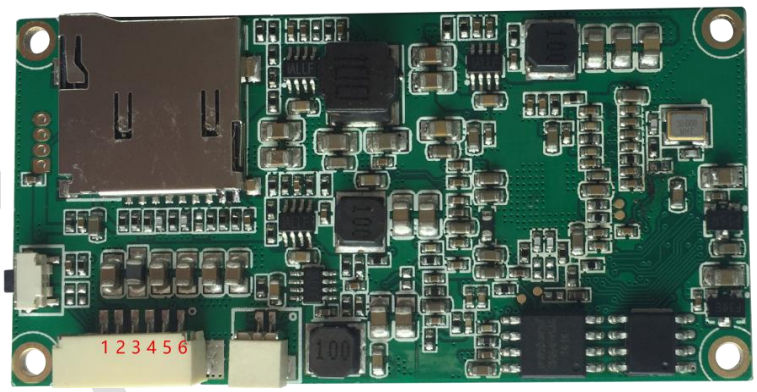


Image 2-3 Size chart of module pin (back side)

2.3 Pin Definition



Pin No.	Name	Description	Remarks
1	GND	DC GND	DC Power GND
2	GND	DC GND	
3	VDD_5V	DC 5V	Input Range 4.8V~16V （5V@500mA）
4	VDD_5V	DC 5V	
5	UART_RXD	Serial Port Acceptance	Transparent Serial Port
6	UART_TXD	Serial Port Transmission	Transparent Serial Port

3 Radio Frequency Characteristics

3.1 IEEE 802.11a

Items	Contents			
Specification	IEEE 802.11a			
Modulation technique	OFDM			
Channel	5180 ~ 5825MHz			
Data rate	6,9,12,18,24,36,48,54Mbps			
TX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**
1. Power Levels(SISO)				
1)Target Power@6Mbps	18	20	22	dBm
2)Target Power@9Mbps	18	20	22	dBm
3)Target Power@12Mbps	18	20	22	dBm
4)Target Power@18Mbps	18	20	22	dBm
5)Target Power@24Mbps	18	20	22	dBm
6)Target Power@36Mbps	15	17	19	dBm
7)Target Power@48Mbps	14	16	18	dBm
8)Target Power@54Mbps	13	15	17	dBm
2. Spectrum Mask@Target Power				
1) at fc ± 11MHz	-	-	-20	dBr
2) at fc ± 20MHz	-	-	-28	dBr
3) at fc > ± 30MHz	-	-	-40	dBr
3. Frequence Error	**-20**	**-**	**+20**	**ppm**
4. Modulation Accuracy(EVM)@Target Power				
1) 6Mbps	-		-5	dB
2) 9Mbps	-		-8	dB
3) 12Mbps	-		-10	dB
4) 18Mbps	-		-13	dB
5) 24Mbps	-		-16	dB

6) 36Mbps	-		-19	dB
7) 48Mbps	-		-22	dB
8) 54Mbps	-	-30	-25	dB
RX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**
5. Minimum Input Level Sensitivity				
1) 6Mbps(PER < 10%)	-	-94	-90	dBm
2) 9Mbps(PER < 10%)	-	-93	-89	dBm
3) 12Mbps(PER < 10%)	-	-92	-88	dBm
4) 18Mbps(PER < 10%)	-	-89	-85	dBm
5) 24Mbps(PER < 10%)	-	-86	-82	dBm
6) 36Mbps(PER < 10%)	-	-82	-78	dBm
7) 48Mbps(PER < 10%)	-	-78	-74	dBm
8) 54Mbps(PER < 10%)	-	-77	-72	dBm
6. Maximum Input Level (PER < 10%)	**-30**	**-**	**-**	**dBm**

3.2 IEEE 802.11n HT20(5G)

Items	**Contents**			
Specification	IEEE 802.11a/n HT20			
Modulation technique	OFDM			
Channel	5180 ~ 5825MHz			
Data rate	MCS0 ~ MCS15			
TX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**
1. Power Levels				
1)Target Power@MCS0	18	20	22	dBm
2)Target Power@MCS1	16	18	20	dBm
3)Target Power@MCS2	16	18	20	dBm
4)Target Power@MCS3	16	18	20	dBm
5)Target Power@MCS4	15	17	19	dBm
6)Target Power@MCS5	14	16	18	dBm

7)Target Power@MCS6	13	15	17	dBm
8)Target Power@MCS7	12	14	16	dBm
2. Spectrum Mask@14dBm				
1) at fc ± 11MHz	-	-	-20	dBr
2) at fc ± 20MHz	-	-	-28	dBr
3) at fc > ± 30MHz	-	-	-45	dBr
3. Frequence Error	-20	-	+20	ppm
4. Modulation Accuracy(EVM)@Target Power				
1) MCS0	-		-5	dB
2) MCS1	-		-10	dB
3) MCS2	-		-13	dB
4) MCS3	-		-16	dB
5) MCS4	-		-19	dB
6) MCS5	-		-22	dB
7) MCS6	-		-25	dB
8) MCS7	-	-30	-28	dB
RX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**
5. Minimum Input Level Sensitivity				
1) MCS0(PER < 10%)	-	-93	-89	dBm
2) MCS1(PER < 10%)	-	-91	-87	dBm
3) MCS2(PER < 10%)	-	-88	-84	dBm
4) MCS3(PER < 10%)	-	-83	-79	dBm
5) MCS4(PER < 10%)	-	-80	-76	dBm
6) MCS5(PER < 10%)	-	-76	-72	dBm
7) MCS6(PER < 10%)	-	-75	-70	dBm
8) MCS7(PER < 10%)	-	-73	-67	dBm
6. Maximum Input Level (PER < 10%)	-30	-	-	dBm

3.3 IEEE 802.11n HT40(5G)

Items	Contents			
Specification	IEEE 802.11a/n HT40			
Modulation technique	OFDM			
Channel	5190 ~ 5815MHz			
Data rate	MCS0 ~ MCS15			
TX Characteristics	Min.	Typ.	Max.	Unit
1. Power Levels				
1)Target Power@MCS0	16	18	20	dBm
2)Target Power@MCS1	15	17	19	dBm
3)Target Power@MCS2	15	17	19	dBm
4)Target Power@MCS3	15	17	19	dBm
5)Target Power@MCS4	14	16	18	dBm
6)Target Power@MCS5	13	15	17	dBm
7)Target Power@MCS6	12	14	16	dBm
8)Target Power@MCS7	11	13	15	dBm
2. Spectrum Mask@14dBm				
1) at fc ± 11MHz	-	-	-20	dBr
2) at fc ± 20MHz	-	-	-28	dBr
3) at fc > ± 30MHz	-	-	-45	dBr
3. Frequence Error	-20	-	+20	ppm
4. Modulation Accuracy(EVM)@Target Power				
1) MCS0	-		-5	dB
2) MCS1	-		-10	dB
3) MCS2	-		-13	dB
4) MCS3	-		-16	dB
5) MCS4	-		-19	dB
6) MCS5	-		-22	dB
7) MCS6	-		-25	dB

8) MCS7	-	-31	-28	dB
RX Characteristics	**Min.**	**Typ.**	**Max.**	**Unit**
5. Minimum Input Level Sensitivity				
1) MCS0(PER < 10%)	-	-89	-85	dBm
2) MCS1(PER < 10%)	-	-87	-83	dBm
3) MCS2(PER < 10%)	-	-84	-80	dBm
4) MCS3(PER < 10%)	-	-80	-76	dBm
5) MCS4(PER < 10%)	-	-77	-73	dBm
6) MCS5(PER < 10%)	-	-73	-69	dBm
7) MCS6(PER < 10%)	-	-71	-67	dBm
8) MCS7(PER < 10%)	-	-70	-64	dBm
6. Maximum Input Level (PER < 10%)	-30	-	-	dBm

4 Electrical Characteristics

4.1 Absolute Maximum Value

The absolute maximum values are shown in the following chart. The values exceeding the maximum value can damage the module devices. In order to prevent the modules and devices from being damaged, please operate under the standard conditions.

Chart 4-1: Parameters and Range

Parameter	Symbol	Value	Unit
External Power Supply Voltage	VDD_5V	4.8~16	V
IO Maximum Input Voltage	$3V3V_{in}IOMax$	3.6	V
IO Minimum Input Voltage	$3V3V_{in}IOMin$	-0.3	V
Storage Environment Temperature	T_{store}	-40~+125	℃
Operating Temperature	Toper	-10~+70	℃

4.2 Recommended Operating Parameter

Chart 4-2: Recommended Operating Parameter Range

Parameter	Symbol	Minimum Value	Typical Value	Maximum Value	Unit
External Voltage	VDD_5V	4.8	5	16	V

5 Order Information

Chart 5-1: Order Model

Product	Description	Quantity/tray	Minimum Packing Quantity
RAK5260	Image transmission modules, plug and play	10 pcs/tray	50 pcs

6 Version

Version	Content modification	Date
V1.0	Create a document	2016-09-01
V1.1	Deletes the audio message error description	2016-11-01