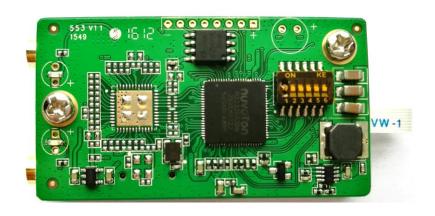


RAK554 图传模块

规格书 V2.6



深圳市瑞科慧联科技有限公司 www. rakwireless. com

邮箱: info@rakwireless.com



目 录

1	概述		1
		模块概述	
		应用领域	
		产品特性	
		规格参数	
2	硬件指	述	3
	2.1	模块视图	3
	2.2	模块尺寸	3
	2.3	安装定位孔	3
	2.4	管脚定义	4
		LED 状态	
		拨码定义	
2		特性	
4		<u> </u>	
	4.1	绝对最大值	13
	4.2	推荐工作参数	13
5	订购信	息	14
6	销售与	ī服务	15
7	版本明	新说明	16



1 概述

1.1 模块概述

RAK554 是一款完全支持 IEEE802.111a/b/g/n 无线协议的超低功耗支持 CVBS 输入的智能视频模块,具有封装小、易于使用的特点。集成了对音频视频图像的采集,编码压缩,传输。采用高效的硬编码方式,强大的 WIFI 通讯模组,保证了视频的清晰,流畅度。由智能终端 Android、iphone 等设备完成音频视频的播放及显示。此外,还具有透传串口的设计。提供一路高速 UART 接口供客户功能扩展。

RAK554 内置 WIFI 模组,支持 802.11a/b/g/n 2x2 MIMO,整体模块可以支持远距离图像传输。

1.2 应用领域

- 飞行器
- 智能玩具
- 楼宇自动化
- 物流和货运管理
- 家庭安全与自动化
- 电网基站巡检

1.3 产品特性

- 强大的 WIFI 功能
 - ➤ 满足 802.11a/b/g/n 协议
 - ▶ 发射功率: ≤22dBm
 - > Soft AP Mode
 - > 2x2 300M PHY Rate
 - ▶ 支持 Infra/Soft AP 网络类型
 - ▶ 支持多种安全认证机制: WEP64/WEP128/ TKIP/CCMP(AES)/ WEP/WPA-PSK/WPA2-PSK
 - ➤ 支持多种网络协议: TCP/UDP/ICMP/DHCP/DNS/HTTP
- 高效的视频处理
 - ➤ 支持 H.264/CIF/VGA/QVGA MJPG/RTP Stream
 - ➤ Continuous/Static JPEG/RTP Stream



- ▶ 20fps 体验流畅的视频
- ▶ 高效的硬编码技术
- ➤ Merged MJPG + MP3 Stream
- ➤ Separate MJPG + MP3 Stream
- ➤ Separate H.264 + PCMA Stream

● 输入源接口

- ▶ 1 路透传串口和 1 路高速 UART 接口资源
- ➤ MIC 接口
- ▶ 视频信号接口
- 模组体积

55mm*30mm*16.3(±0.2)mm (DIP LED)

55mm*30mm*13.1(±0.2)mm (Without LED)

1.4 规格参数

参数	描述
传输距离	有效距离 1000m, 较清晰流畅距离 500m
尺寸参数	55mm*30mm*16.3(±0.2)mm (DIP LED)
八寸参数	55mm*30mm*13.1(±0.2)mm (Without LED)
串口透传波特率	115200bps (默认), 可通过命令修改
无线参数	满足 802.11a/b/g/n 协议,支持 Infra/Soft AP 网络类型,支持 Soft AP
电源参数	7-24V 电源,平均工作电流 150mA(输入电压为典型值:12V)
电视参数	峰值电流是 300mA(输入电压为典型值:12V)
CPU	ARM926EJ-S
操作系统	Linux-2.6.35.5



2 硬件描述

2.1 模块视图





图2-1 RAK554 模块正面

图2-2 RAK554 模块反面

2.2 模块尺寸

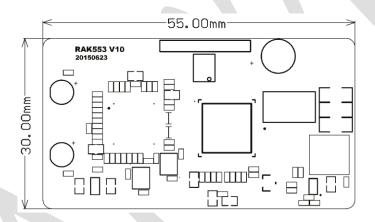
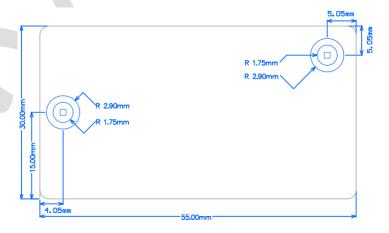


图2-3 模块平面尺寸图

2.3 安装定位孔





2.4 管脚定义

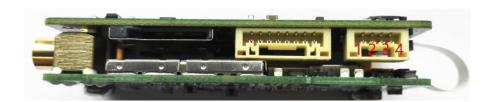


图2-4 电源接口线序

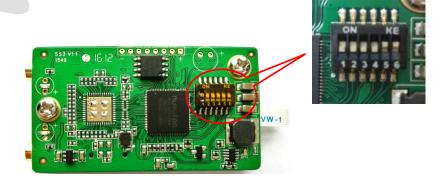
脚号	名称	描述	备注
1	VDDIN	12V 供电	P
2	VDDIN	12V 供电	P
3	GND	地	P
4	GND	地	P

2.5 LED 状态



备注: LED 状态指示灯会根据实际的情况以及客户的需求调整,颜色可以更换。

2.6 拨码定义





拨码共计 6 组,ON 表示当前拨码接地,为低电平 0 。拨码处于数字边表示为高电平 1 。 拨码编码顺序用 Sw1-6 表示。功能定义如下:

Sw6	Sw5	Band	信道	工作中心频率
1	1	4	149	5745
1	0	1	48	5240
0	1	1	36	5180
0	0	4	165	5825

出厂默认是 Band4 , 149 信道。

Sw1 你作为 WPS 的拨码控制吧,拉低后,保持3秒,之后马上拉高,就进入 WPS 配置状态。 进入 WPS 状态指示灯闪烁。





3 射频特性

Item	Key specifications							
Chip	O QCA AR9375							
TX/RX	O 2T2R							
Frequency	O USA: 2.400 ~ 2.483GHz, 5.15 ~ 5.25GHz, 5.725 ~ 5.85GHz							
range	O Europe: 2.400 ~ 2.483GHz, 5.15 ~ 5.25GHz							
range	O Japan: 2.400 ~ 2.497GHz, 5.15 ~ 5.25GHz,							
	O 802.11 Legacy a/b/g							
	DSSS (DBPSK, DQPSK, CCK)							
	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)							
	DSSS (Direct Sequence Spread Spectrum) with							
Modulation	DBPSK (Differential Binary Phase Shift Keying 1Mbps),							
technique	DQPSK (Differential Quaternary Phase Shift Keying 2Mbps), and							
	CCK (Complementary Code Keying 5.5&11Mbps), and							
	OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6,9Mbps QPSK							
	for 12,18Mbps 16QAM for 24,36Mbps 64QAM							
	for 48,54Mbps)							
Host interface Channels support	O 802.11n a/g O USB 2.0 O 802.11n b/g US/Canada: 11 (1 ~ 11) Major European country: 13 (1 ~ 13) France: 4 (10 ~ 13) Japan: 11b: 14 (1~13 or 14 th), 11g: 13 (1 ~ 13)							
	O 802.11n a							
	1). US/Canada: channels (36,40,44,48,52, 149,153,157,161,165)							
	2). Europe: channel (36,40,44,48,52)							
	3). Japan: channels (36,40,44,48,52)							
Operation voltage	O 5V +/- 5%							
Power consumption	802.11ng MCS8(40MHz) 802.11na MCS8(40MHz) (mA) Avg Avg							
@25°C	5V 350 756							



The simplest, the		11.							
		.11a		(3.4 FF :	26 E	40.75	, -	• 4 m	
	[Test Frequence	cies (5-24_Target	36_Targ		_	54_Target	
		5180		21	20		19	17	
Output Power		5320		21	20		19	17	
_		5500		21	20		19	17	
(Typical-for		5600		21	20		19	17	
each chain;		5700		21	20		19	17	
with ±2dB		5825		21	20	-	19	17	
tolerance).		441							
This power		.11b							
_	[7	Test Frequenc	cies 1	l/2_Target	5.5_Targ		get		
table bases on		2412		16	16	16			
the maximum		2437		16	16	16			
HW capability		2472		16	16	16			
complying									
with IEEE		.11g							
spec	[7	Test Frequenc	cies (6-24_Target	36_Targ	get 48_Tar	get 5	54_Target	
regardless the		2412		16	16	15		14	
regulatory		2437		16	16	15		14	
limitation		2472		16	16	15		14	
]								
	O 802	.11n							
	Freq. R	ange: HT20							
			MCS 1/	9 MCS 2/10	MCS 3/11	MCS 4/12 M	ICS 5/13	MCS 6/14	MCS 7/15
	5180		21	21	21	20	20	19	17
	5240		21	21	21	20	20	19	17
	5320		21	21	21	20	20	19	17
	5500		21	21	21	20	20	19	17
	5700		21	21	21	20	20	19	17
	5745		21	21	21	20	20	19	17
	5825		21	21	21	20	20	19	17
							_~		- <i>-</i>
	Frea. R	ange: HT40							
			MCS 1/	9 MCS 2/10	MCS 3/11	MCS 4/12 M	ICS 5/13	MCS 6/14	MCS 7/15
	5190	21	21	21	21	20	20	19	17
	5230	21	21	21	21	20	20	19	17
	5310	21	21	21	21	20	20	19	17
	5510	21	21	21	21	20	20	19	17
	5670	21	21	21	21	20	20	19	17
	5755	21	21	21	21	20	20	19	17
	5795	21	21	21	21	20	20	19	17
	3175	21		21	21	20	20	17	17
	Freg. R	ange: HT20							
	_		MCS 1/	9 MCS 2/10	MCS 3/11	MCS 4/12 M	CS 5/13	MCS 6/14	MCS 7/15
	2412	16	16	16	16	15	15	14	14
	2437	16	16	16 16	16	15	15	14	14
	2472	16	16	16	16	15	15 15	14	14
	27,2	10	10	10	10	13	13	17	17
	Frea R	ange: HT40							
	Teet Fr	rea MCS n/s	MCS 1	9 MCS 2/10	MCS 3/11	MCS 4/12 M	CS 5/13	MCS 6/14	MCS 7/15
	2412		16	9 MCS 2/10 16	16	15	15	14	14
	2412		16 16	16 16	16 16	15 15	15 15	14 14	14 14
	2437		16 16	16 16	16 16	15 15	15 15	14 14	14 14
	24/2	10	10	10	10	13	13	14	14



EVM

The transmit modulation accuracy is measured using error vector magnitude (EVM).

O 802.11a Modulation	Code Rate	Relative constellation error (dB) IEEE Spec (1Tx dB)	Relative constellation error (dB) Typical (1Tx dB)
BPSK	1/2	-5	-25
BPSK	3/4	-8	-25
QPSK	1/2	-10	-25
QPSK	3/4	-13	-25
16-QAM	1/2	-16	-25
16-QAM	3/4	-19	-28
64-QAM	2/3	-22	-30
64-QAM	3/4	-25	-31
O 802.11b			
Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB
		IEEE Spec (1Tx dB)	Typical (1Tx dB)
DBPSK		-10	-28
DQPSK		-10	-28
ССК		-10	-28
O 802.11g			
Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB
		IEEE Spec (1Tx dB)	Typical (1Tx dB)
BPSK	1/2	-5	-28
BPSK	3/4	-8	-28
QPSK	1/2	-10	-28
QPSK	3/4	-13	-28
16-QAM	1/2	-16	-28
16-QAM	3/4	-19	-29
64-QAM	2/3	-22	-29
64-QAM	3/4	-25	-29
802.11ng			
Modulation	Code Rate I	Relative constellation error (dB)	Relative constellation error (
НТ20		IEEE Spec (1Tx dB)	Typical (1Tx dB)
	PSK 1/2	-5	-25
	PSK 1/2	-10	-26
, , -	PSK 3/4 5-QAM 1/2	-13 -16	-26 -26

HT20			IEEE Spec (1Tx dB)	Typical (1Tx dB)	
(MCS0)	BPSK	1/2	-5	-25	
(MCS1)	QPSK	1/2	-10	-26	
(MCS2)	QPSK	3/4	-13	-26	
(MCS3)	16-QAM	1/2	-16	-26	
(MCS4)	16-QAM	3/4	-19	-29	
(MCS5)	64-QAM	2/3	-22	-30	
(MCS6)	64-QAM	3/4	-25	-30	
(MCS7)	64-QAM	5/6	-27	-31	
(MCS8)	BPSK	1/2	-5	-25	
(MCS9)	QPSK	1/2	-10	-26	
(MCS10)	QPSK	3/4	-13	-26	



	The simplest, the	2000				
		(MCS11)	16-QAM	1/2	-16	-26
		(MCS12)	16-QAM	3/4	-19	-29
		(MCS13)	64-QAM	2/3	-22	-30
		(MCS14)	64-QAM	3/4	-25	-30
		(MCS15)	64-OAM	5/6	-27	-31
		(======)	V . (-
		HT40				
		(MCS0)	BPSK	1/2	-5	-26
		(MCS1)	QPSK	1/2	-10	-27
		(MCS2)	QPSK	3/4	-13	-27
		(MCS3)	16-QAM	1/2	-16	-27
		(MCS4)	16-QAM	3/4	-19	-29
		(MCS5)	64-QAM	2/3	-22	-30
		(MCS6)	64-QAM		-25	-30
		(MCS7)	64-QAM	5/6	-27	-31
		(MCS8)	BPSK	1/2	-5	-26
		(MCS9)	QPSK	1/2	-10	-27
		(MCS10)	-	3/4	-13	-27
		(MCS11)			-16	-27
		(MCS12)	_		-19	-29
		(MCS13)	-		-22	-30
		(MCS14)	64-QAM	3/4	-25	-30
		(MCS15)	64-QAM	5/6	-27	-31
		O 802.11na	_			
1	EVM			Rate	Relative constellation error (dB)	Relative constellation error (dB)
	L V 1/1	1,10ddinetic)II			` '
		HT20			IEEE Spec (1Tx dB)	Typical (1Tx dB)
		(MCS0)	BPSK	1/2	-5	-25
		(MCS0) (MCS1)	BPSK QPSK	1/2 1/2	-5 -10	-25 -26
		(MCS1)	QPSK	1/2 3/4	-10	-26
		(MCS1) (MCS2)	QPSK QPSK	1/2 3/4 1/2	-10 -13	-26 -26
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5)	QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3	-10 -13 -16 -19 -22	-26 -26 -26 -29 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6)	QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4	-10 -13 -16 -19 -22 -25	-26 -26 -26 -29 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27	-26 -26 -26 -29 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2	-10 -13 -16 -19 -22 -25 -27 -5	-26 -26 -26 -29 -30 -31 -25
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK	1/2 3/4 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10	-26 -26 -26 -29 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK QPSK	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4	-10 -13 -16 -19 -22 -25 -27 -5	-26 -26 -26 -29 -30 -31 -25
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16	-26 -26 -29 -30 -31 -25 -26 -26
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19	-26 -26 -29 -30 -31 -25 -26 -26 -26 -29
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13)	QPSK QPSK 16-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22	-26 -26 -29 -30 -31 -25 -26 -26 -26 -29 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -27 -30 -30 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22	-26 -26 -29 -30 -31 -25 -26 -26 -26 -29 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -27 -30 -30 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -27 -30 -30 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -27 -30 -30 -30 -31
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -31 -30 -31
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -30 -31
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS0)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM BPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -31 -30 -31
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS2) (MCS2)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -31 -27 -27
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS0) (MCS1) (MCS2) (MCS3) (MCS3)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -31 -27 -27 -27
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS3) (MCS3) (MCS3) (MCS4) (MCS4)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -29 -30 -31 -27 -27 -27 -29 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS2) (MCS3) (MCS2) (MCS3) (MCS4) (MCS5) (MCS5)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 1/2 3/4 2/3 3/4 1/2 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -29 -30 -31 -27 -27 -27 -27 -29 -30 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS0) (MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS6)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 2/3 3/4 5/6	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -29 -30 -30 -31 -27 -27 -27 -27 -29 -30 -30 -31
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS2) (MCS3) (MCS2) (MCS3) (MCS4) (MCS5) (MCS5)	QPSK QPSK 16-QAM 64-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 1/2 3/4 1/2 3/4 2/3 3/4 1/2 3/4	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -26 -26 -29 -30 -31 -27 -27 -27 -27 -29 -30 -30 -30
		(MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS7) (MCS8) (MCS9) (MCS10) (MCS11) (MCS12) (MCS13) (MCS14) (MCS15) HT40 (MCS0) (MCS1) (MCS2) (MCS3) (MCS4) (MCS5) (MCS6) (MCS6) (MCS7) (MCS8)	QPSK QPSK 16-QAM 16-QAM 64-QAM 64-QAM 16-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM 64-QAM	1/2 3/4 1/2 3/4 2/3 3/4 5/6 1/2 1/2 3/4 2/3 3/4 5/6 1/2 3/4 1/2 3/4 2/3 3/4 1/2 3/4 1/2 3/4 1/2	-10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -22 -25 -27 -5 -10 -13 -16 -19 -25 -27	-26 -26 -29 -30 -30 -31 -25 -26 -26 -29 -30 -31 -27 -27 -27 -27 -29 -30 -31 -31



	e best			
	(MCS11) 16-QAM	I 1/2	-16	-27
	(MCS12) 16-QAM	I 3/4	-19	-29
	(MCS13) 64-QAM		-22	-30
	(MCS14) 64-QAM		-25	-30
	, , , , , , , , , , , , , , , , , , , ,			
	(MCS15) <u>64-QAM</u>	1 5/6	-27	-31
	000 11			
	O 802.11a		TEEE C (4D ID)	m
	Modulation		IEEE Spec (1Rx dBm)	Typical (1Rx dBm)
	BPSK	1/2	-82	-88
	BPSK	3/4	-81	-86
	QPSK	1/2	-79	-85
	QPSK	3/4	-77	-83
	16-QAM	1/2	-74	-79
	16-QAM	3/4	-70	-77
	_	2/3	-66	-73
	64-QAM			
	64-QAM	3/4	-65	-70
	O 802.11b			
	Modulation	IE	EE Spec (1Rx dBm)	Typical (1Rx dBm)
	DBPSK		not specified	-93
	DQPSK		not specified	-91
	CCK		not specified	-87
	O 802.11g			
	Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical (1Rx dBm)
	BPSK	1/2	-82	-93
	BPSK	3/4	-81	-91
	QPSK	1/2	-79	-89
	QPSK	3/4	-77	-86
Sensitivity	16-QAM	1/2	-74	-83
(1RX with	16-QAM	3/4	-70	-80
+4/-2dB	64-QAM	2/3	-66	-75
tolerance,				
dBm)	64-QAM	3/4	-65	-70
,	O 802.11ng			
	Modulation	Code Ra	te IEEE Spec (1Rx dBm)	Typical (1Rx dBm)
	Modulation	Couc Ita	ate IEEE Spee (IRX abiii)	Typicai (Tixa ubiii)
	HT20			
		1/2	92	00
	(MCS0) BPSK	1/2	-82	-90
	(MCS1) QPSK	1/2	-79	-87
	(MCS2) QPSK	3/4	-77	-86
	(MCS3) 16-QAM	1/2	-74	-84
	(MCS4) 16-QAM	3/4	-70	-80
	(MCS5) 64-QAM	2/3	-66	-77
	(MCS6) 64-QAM	3/4	-65	-72
	, , , , ,			
	(MCS7) 64-QAM	5/6	-64	-67
	HT40			
	(MCS0) BPSK	1/2	-79	-88
	(MCS1) QPSK	1/2	-76	-86
	(MCS2) QPSK	3/4	-74	-84
	(MCS3) 16-QAM	1/2	-7 4 -71	-80
	(MCS4) 16-QAM	3/4	-67	-78 -73
	(MCS5) 64-QAM	2/3	-63	-73
	(MCS6) 64-QAM	3/4	-62	-70
	(MCS7) 64-QAM	5/6	-61	-64
I	[(MCS/) 04-QAM	3/0	-01	-v -1



	O 802.11na									
	HT20	Modulation	Co	da Data		IFF	F Sno	o (1Dv.	dRm)	
	(MCS0) BPSK	1/2	tion Code Rate -82			IEEE Spec (1Rx dBm) -89				
	(MCS1) QPSK	1/2		-79				87		
	(MCS2) QPSK	3/4		-77				84		
	(MCS3) 16-QAM	1/2		-74				80		
	(MCS4) 16-QAM	3/4		-70				77		
	(MCS5) 64-QAM	2/3		-66				72		
	(MCS6) 64-QAM	3/4		-65				71		
	(MCS7) 64-QAM	5/6		-64				67		
Sensitivity	HT40									
(1RX with	(MCS0) BPSK	1/2		-79				84		
+4/-2dB	(MCSI) QPSK	1/2		-76				81		
	(MCS2) QPSK	3/4		-70 -74				01 79		
tolerance, dBm)	(MCS3) 16-QAM	3/4 1/2		-74 -71				76		
ubiii)	(MCS4) 16-QAM	3/4		-/1 -67				70 72		
	(MCS5) 64-QAM	2/3		-63				72 70		
	(MCS6) 64-QAM	3/4		-62				67		
	(MCS7) 64-QAM	5/4 5/6		-61				64		
	Exercise For transmitted		mask for	_	shall	be	less	than	-40dBr	fo
	fc-30MHz <f<fc+30mh< td=""><td></td><td>mask to</td><td>1114</td><td>Shan</td><td>be</td><td>iess</td><td>unan</td><td>-40ubr</td><td>10</td></f<fc+30mh<>		mask to	1114	Shan	be	iess	unan	-40ubr	10
Transmit	© For transmitted		mask for	· 11h	shall	be	less	than	-50dBr	fo
spectrum mask	fc-22MHz <f<fc+22mh< td=""><td>Iz.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></f<fc+22mh<>	Iz.								
	② For transmitted fc-30MHz <f<fc+30mh< td=""><td></td><td>mask for</td><td>11g</td><td>shall</td><td>be</td><td>less</td><td>than</td><td>–40dBr</td><td>fo</td></f<fc+30mh<>		mask for	11g	shall	be	less	than	–40dBr	fo
	© For transmitted spectral mask for 11n 20MHz shall be less than -45dBr for									
	fc-30MHz <f<fc+30mh< td=""><td>Iz.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></f<fc+30mh<>	Iz.								
	② For transmitted sp	oectral mask f	or 11n 40N	IHz sha	ll be less	than	-45	dBr for	•	
	_fc-60MHz <f<fc+60mh< th=""><th>lz.</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></f<fc+60mh<>	lz.								
	1 For 902 11 a/a tha									
Transmit	② For 802.11a/g the							ral lines	s –161	and
Transmit	+1+16 will deviate no	more than +/-	- 2dB from	their av	verage e	nergy	·•			and
Transmit spectrum	+1+16 will deviate no For 802.11n 40MHz m	more than +/- node, the avera	- 2dB from age energy	their av	verage e onstellat	nergy ions i	n each	of spe	ctral	and
	+1+16 will deviate no For 802,11n 40MHz m lines –422 and +2+4	more than +/- node, the avera 42 will deviate	- 2dB from age energy e no more t	their av of the co han +/-	verage e onstellat 2dB fro	nergy tions i m the	n each	of spe	ctral	and
spectrum	+1+16 will deviate no For 802.11n 40MHz m	more than +/- node, the avera 42 will deviate	- 2dB from age energy e no more t	their av of the co han +/-	verage e onstellat 2dB fro	nergy tions i m the	n each	of spe	ctral	and
spectrum flatness Transmit	+1+16 will deviate no For 802,11n 40MHz m lines –422 and +2+4	more than +/- node, the avera 42 will deviate	- 2dB from age energy e no more t	their av of the co han +/-	verage e onstellat 2dB fro	nergy tions i m the	n each	of spe	ctral	and
spectrum flatness Transmit center	+1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted specific	more than +/- node, the avera 42 will deviate ectral flatness	- 2dB from age energy e no more t should be	their av of the co han +/- with in +	verage e onstellat 2dB froi -2/- 4dB.	nergy ions i m the	n each ir avei	of spec	ctral	and
spectrum flatness Transmit center frequency	+1+16 will deviate no For 802,11n 40MHz m lines –422 and +2+4	more than +/- node, the avera 42 will deviate ectral flatness	- 2dB from age energy e no more t should be	their av of the co han +/- with in +	verage e onstellat 2dB froi -2/- 4dB.	nergy ions i m the	n each ir avei	of spec	ctral	and
spectrum flatness Transmit center	+1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted specific	more than +/- node, the avera 42 will deviate ectral flatness	- 2dB from age energy e no more t should be	their av of the co han +/- with in +	verage e onstellat 2dB froi -2/- 4dB.	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance	+1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted specific	more than +/- node, the avera 42 will deviate ectral flatness	- 2dB from age energy e no more t should be	their av of the co han +/- with in +	verage e onstellat 2dB froi -2/- 4dB.	nergy ions i m the	n each ir avei	of spec	ctral	and
spectrum flatness Transmit center frequency	+1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted sp The transmitted co	more than +/- node, the avera 42 will deviate ectral flatness	- 2dB from age energy e no more t should be v	their av of the co han +/- vith in + e shall b	verage e onstellat 2dB froi -2/- 4dB.	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	+1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted sp The transmitted co	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v	their avof the cohan +/- vith in + e shall b	verage e onstellat 2dB froi -2/- 4dB. oe ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance	+1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+4 The transmitted sp The transmitted co	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v cy toleranc	their av of the co han +/- vith in + e shall b	verage e onstellat 2dB froi -2/- 4dB. oe ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	+1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+4 The transmitted spoon of the transmitted company of the tra	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v cy toleranc IEEE S	their avof the cohan +/- vith in + e shall b	verage e onstellat 2dB from -2/- 4dB. De ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	#1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted spoon of the transmitted comparison of t	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v cy tolerance IEEE S	their avof the cohan +/- vith in + e shall b spec (1R	verage e onstellat 2dB froi -2/- 4dB. oe ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	#1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted spoon of the transmitted comparison of t	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v cy toleranc IEEE S	their avof the cohan +/- vith in + e shall b spec (1R -30	verage e onstellat 2dB from -2/- 4dB. De ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	#1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted spoon of the transmitted comparison of t	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy e no more t should be v cy toleranc IEEE S	their avof the cohan +/- vith in + e shall b spec (1R	verage e onstellat 2dB from -2/- 4dB. De ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	#1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted spoon of the transmitted comparison of t	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy eno more to should be very tolerance Service Ser	their avof the cohan +/- vith in + e shall b spec (1R -30	verage e onstellat 2dB from -2/- 4dB. De ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and
Transmit center frequency tolerance Receiver maximum	#1+16 will deviate no For 802.11n 40MHz m lines –422 and +2+4 The transmitted spoon of the transmitted component of the tran	more than +/- node, the avera 42 will deviate ectral flatness enter frequence	- 2dB from age energy eno more t should be very tolerance Service Serv	their avof the cohan +/- vith in + e shall b spec (1R -30 spec (1R -10 >-10	verage e onstellat 2dB from -2/- 4dB. De ±20 p	nergy ions i m the	n each ir avei	of spec	ctral	and



	② 802.11na Modulation Code Rate IEEE Spec (1Rx dBm) >-30
	© 802.11ng Modulation Code Rate IEEE Spec (1Rx dBm) >-20
Transfer data rate	 ② 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps ② 802.11b: 1, 2, 5.5, 11Mbps ② 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps ③ 802.11n: @800GI(400GI) z 20MHz BW 1 Nss: 65(72.2) Mbps maximal z Nss: 130(144.444) Mbps maximal z 40MHz BW 1 Nss: 135(150) Mbps maximal 2 Nss: 270(300) Mbps maximal



4 电气特性

4.1 绝对最大值

下表中给出绝对最大值,超过该最大值范围可能使模块器件受损。为避免模块及器件受损 请在规定条件下进行操作。

表 3-1:参数及范围

参数	符号	数值	单位
外部电源电压	VDDIN	7~~24	V
I0 口最大输入电压	3V3V _{in} IOMax	3.6	V
IO 口最小输入电压	3V3V _{in} IOMin	-0.3	V
存储环境温度	T_{store}	-40~~+125	${\mathbb C}$
工作温度	Toper	-20~~+65	°C

4.2 推荐工作参数

表 3-2: 推荐工作参数范围

参数	符号	最小值	典型值	最大值	单位
外部电压	VDDIN	7.0	12.0	24.0	V



5 订购信息

表 5-1: 订购型号

产品	描述	单托盘数量	最小包装数量
RAK554	图传模组,即插即用	12 片/tray	60 片





6 销售与服务

深圳总部

FAE 邮箱: ken.yu@rakwireless.com

电话: 0755-86108311

地址:深圳市南山区高新南六道航盛科技大厦 1007

上海

FAE 邮箱: steven.tang@rakwireless.com

电话:021-61553990

地址:上海市闵行区虹梅南路 2588 弄绿亮科创园 B205

北京

FAE 邮箱: allan.jin@rakwireless.com

地址:北京市昌平区回龙观腾讯众创空间





7 版本更新说明

版本号	修改内容	修改日期
V0.1	修改文档格式	2014-07-09
V0.2	更新联系方式,更新文档格式	2014-08-22
V0.3	更新图片、传输距离;修改产品特性;增加订购信息、销售与	2014-10-24
	服务	
V0.4	更新新模块的图片,尺寸及管脚定义	2015-04-07
V0.5	添加透传串口功能说明及参考设计	2015-04-17
V0.6	更新输入电压	2015-05-17
V0.7	更新新版模块实物图和相关硬件标注	2015-07-13
	更改电源参数,以及工作电流。	
V0.8	添加峰值工作电流	2015-07-31
V2.0	添加 LED 状态指示说明。并正式发布文档。	2015-08-31
V2.1	添加拨码定义指示说明。	2015-10-11
	1,增加信道选择功能。	
	2,增加 WPS 配对功能。	
V2.2	修改 8PIN eGH 接口 pin1 和 pin2 的定义。修改为 NC。	2015-11-11
V2.3	增加安装定位孔位置图。	2016-02-29
V2.4	删除部分错误分辨率,删除音频输入描述。	2016-8-25
V2.5	1,更新销售服务信息	2016-11-10
	2, 更新产品图片	
V2.6	更新信道列表错误表述。	2017-03-03