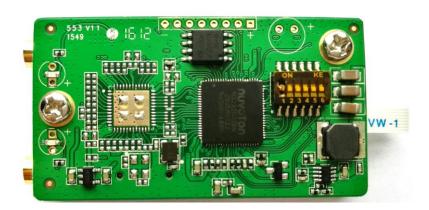


RAK554 Image Transmission Module

Specification V2.6



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1 Overview

1.1 Module overview

RAK554 supports IEEE802.111a/b/g/n wireless protocol and is an ultra-low power consumption intelligent image transmission module. It has small foot print and the easy using feature. The Module support the H.264 codec, the sound processor and is specially designed for accelerating video/audio streaming performance. To fast the evaluation, the user can get the demo Apps on Android, iPhone and other equipment to complete the play and display of audio and video. RAK554 integrates the high-speed serial port to use for transparent in interaction.

RAK554 integrates the WIFI Module ,which support IEEE 802.11a/b/g/n 2x2 MIMO.The module support the remote image transmission.

1.2 Application Field

- Air vehicle
- Smart toys
- Building Automation
- Logistics and freight management
- Family safety and automation
- Safety Inspection

1.3 Product Features

• Powerful WIFI

- Support IEEE 802.11a/b/g/n protocol
- ightharpoonup TX Power $\leq 22 dBm$
- Soft AP Mode
- > 2x2 300M PHY Rate
- support Infra/Soft AP network type
- > support multiple security authentication mechanism: WEP64/WEP128/TKIP/CCMP (AES) /

WEP/WPA-PSK/WPA2-PSK

supporting many network protocol: TCP/UDP/ICMP/DHCP/DNS/HTTP

• Efficient video processing

- support H.264/CIF/VGA/QVGA MJPG Stream
- Continuous/Static JPEG/RTP Stream
- Supports up to the 720p @ 25fps video resolution
- Pure Hardware engine



- Merged MJPG + MP3 Stream
- ➤ Separate MJPG + MP3 Stream
- ➤ Separate H.264 + PCMA Stream
- Input Interface
 - ➤ 1 UART for transparent and 1 high- speed UART
 - > MIC Interface for audio
 - Video input Interface
- Module size

55mm*30mm*16.3(±0.2)mm (DIP LED)

55mm*30mm*13.1(±0.2)mm (Without LED)

1.4 Specifications

Parameters	Description
Transmission distance	Effective distance: 1000m; Smooth video transmission: 500m.
Size	55mm*30mm*16.3(±0.2)mm (DIP LED) 55mm*30mm*13.1(±0.2)mm (Without LED)
Baud rate	115200bps (default) for transparent transmission, customers can modify it by command
Wireless parameters	Support IEEE 802.11a/b/g/n protocol,and Infra / Soft AP network; Support Soft AP connect.
power	Power supply:7.0V~~24V;Operation current :150mA(Typical Power Value: 12V); Wifi Peak current :300mA(Typical Power Value: 12V)
CPU	ARM926EJ-S
Operating system	Linux-2.6.35.5



2 Hardware Overview

2.1 Modules view





Figure 2-1 RAK554 module Top view

Figure 2-2 RAK554 module Bottom view

2.2 Module size

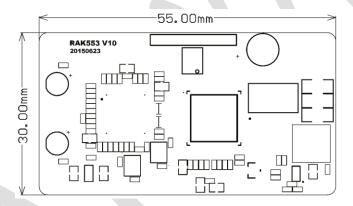
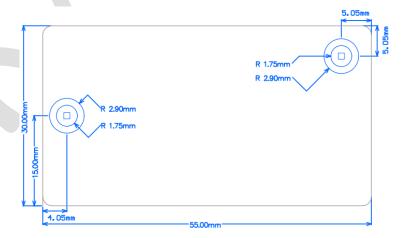


Figure 2-3 RAK554 Plane size

2.3 Location hole map





2.4 Pin definition

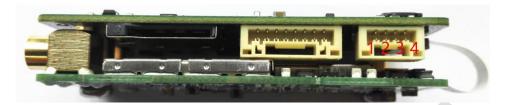


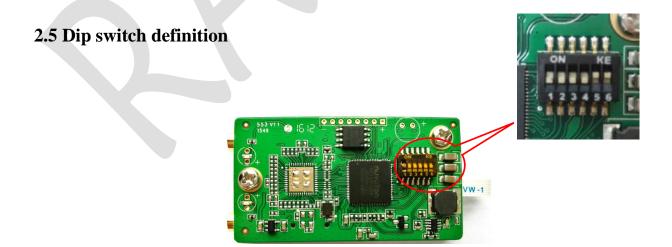
Figure 2-4 power supply

Pin	Name	Description	Remark
1	VDDIN	12V VCC	12V power input
2	VDDIN	12V VCC	12V power input
3	GND	GND	GND
4	GND	GND	GND

2.4 LED State



Note: LED will be changed by the demands of final customers.



There are 6 group Dial-up in the module . ON direction is showing low-level ,marked as 0.



When The Dial-up is on the opposite direction ,that is showing high-level,marked as 1.

The dial-up flag order is 1-6,marked as sw1-6.

The function definition is followed:

Sw6	Sw5	Band	Channel	Central Frequency
1	1	Band4	149	5745
1	0	Band1	48	5240
0	1	Band1	36	5180
0	0	Band4	165	5825

The default band is Band4. That is to say channel 149. If you are localing on china or Taiwan, you'd better set he channel to Band4 any channel.

Sw1 is using for WPS function . If you want to use this function , you need do the following steps.

- 1) Whatever the SW1 level , set SW1 into low-level more than 1 second .
- 2) Then Set SW1 into high-level.
- 3) The Wifi light will blink.that is showing you have step into the WPS mode.





3 RF Characteristic

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)
	O 802.11n a/g
Host interface	O USB 2.0
	O 802.11n b/g
	US/Canada: 11 (1 ~ 11)
	Major European country: 13 (1 ~ 13)
Channels	France: 4 (10 ~ 13)
support	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	802.11ng MCS8(40MHz) 802.11na MCS8(40MHz)
consumption	(mA) Avg Avg
@25 °C	5V 350 756
@25 C	



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 Frequen	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).

EVM is the magn	nitude of the p	phase difference as a function of time	ne between an ideal
reference signal a	and the measu	red transmitted signal.	
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
CCK		-10	-28
		10	20
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
O 802.11ng			
Modulation	Code Rate R	Relative constellation error (dB)	Relative constellation error (dB)
HT20		IEEE Spec (1Tx dB)	Typical (1Tx dB)
	PSK 1/2	-5	-25
	PSK 1/2	-10	-26 26
(MCS2) Q	PSK 3/4	-13	-26

НТ2	0		IEEE Spec (1Tx dB)	Typical (1Tx dB)
(MCS		1/2	-5	-25
(MCS	1) QPSK	1/2	-10	-26
(MCS	2) QPSK	3/4	-13	-26
(MCS	3) 16-QAM	1/2	-16	-26
(MCS	4) 16-QAM	3/4	-19	-29
(MCS	5) 64-QAM	2/3	-22	-30
(MCS	6) 64-QAM	3/4	-25	-30
(MCS	7) 64-QAM	5/6	-27	-31
(MCS	8) BPSK	1/2	-5	-25
(MCS	9) QPSK	1/2	-10	-26
(MCS	10) QPSK	3/4	-13	-26



The simplest, the					
	(MCS11)	16-QAM	1/2	-16	-26
	(MCS12)	16-QAM	3/4	-19	-29
	(MCS13)	64-QAM	2/3	-22	-30
		64-QAM		-25	-30
	` ,	64-QAM		-27	-31
	(MCS13)	04-QAM	3/0	-21	-31
	HT40				
	(MCS0)	BPSK	1/2	-5	-26
	(MCS1)	QPSK	1/2	-10	-27
	` ′	QPSK	3/4	-13	-27
	(MCS2)				-27
	(MCS3)	16-QAM		-16	
	(MCS4)	16-QAM		-19	-29
	(MCS5)	64-QAM		-22	-30
	(MCS6)	64-QAM		-25	-30
	(MCS7)	64-QAM		-27	-31
	(MCS8)	BPSK	1/2	-5	-26
	(MCS9)	QPSK	1/2	-10	-27
	(MCS10)	QPSK	3/4	-13	-27
	(MCS11)	16-QAM	1/2	-16	-27
	(MCS12)	16-QAM	3/4	-19	-29
	(MCS13)	64-QAM	2/3	-22	-30
	` /	64-QAM		-25	-30
	` ′	64-QAM		-27	-31
	O 802.11na	1			
EVM			Rate I	Relative constellation error (dB)	Relative constellation error (dB)
	1/10ddiner				· ´
	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		-16	-26
	(MCS4)	16-QAM		-19	-29
	(MCS5)	64-QAM		-22	-30
	(MCS6)	64-QAM		-22 -25	-30
	(MCS7)	64-QAM		-23	-31
		_			
	(MCS8)	BPSK	1/2	-5 10	-25
	(MCS9)	QPSK	1/2	-10	-26
	(MCS10)		3/4	-13	-26
		16-QAM		-16	-26
		16-QAM		-19	-29
		64-QAM		-22	-30
	(MCS14)	64-QAM	3/4	-25	-30
	(MCS15)	64-QAM	5/6	-27	-31
	, ,				
	IIT40				
	HT40	DDCIZ	1/2	=	26
	(MCS0)	BPSK	1/2	-5 10	-26 27
	(MCS1)	QPSK	1/2	-10	-27
	(MCS2)	QPSK	3/4	-13	-27
	(MCS3)	16-QAM		-16	-27
	(MCS4)	16-QAM		-19	-29
1	(MCS5)	64-QAM		-22	-30
1	(MCS6)	64-QAM		-25	-30
1	(MCS7)	64-QAM		-27	-31
1	(MCS8)	BPSK	1/2	-5	-26
	(MCS9)	QPSK	1/2	-10	-27
	(MCS9) (MCS10)		1/2 3/4	-10 -13	



The simplest, th	e best			
	(MCS11) 16-QAM	1/2	-16	-27
	(MCS12) 16-QAM		-19	-29
	(MCS13) 64-QAM		-22	-30
	(MCS14) 64-QAM		-25	-30
	, , , , , ,			
	(MCS15) <u>64-QAM</u>	5/6	-27	-31
	O 802.11a			
	Modulation	Codo Doto	IEEE Spec (1Rx dBm)	Typical (1Rx dBm)
	BPSK	1/2	-82	-88
	BPSK	3/4	-81 -70	-86
	QPSK	1/2	-79 -7-	-85
	QPSK	3/4	-77 	-83
	16-QAM	1/2	-74	-79
	16-QAM	3/4	-70	-77
	64-QAM	2/3	-66	-73
	64-QAM	3/4	-65	-70
	_			
	O 802.11b			
	Modulation	IEI	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
ubiii)	o 802.11ng			
	O 802.11ng Modulation	Codo Do	te IEEE Spec (1Rx dBm)	Transport (1Dr. dDm)
	Modulation	Code Ra	te IEEE Spec (IKX abiii)	Typical (1Rx dBm)
	HT20			
	(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	-7 4 -7 0	-80
	(MCS5) 64-QAM	2/3	-66	-77
	(MCS6) 64-QAM	3/4	-65	-77 -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	-71	-80
	(MCS4) 16-QAM	3/4	-67	-78
	(MCS5) 64-QAM	2/3	-63	-73
	(MCS6) 64-QAM	3/4	-62	-70
	, , ,			
	(MCS7) 64-QAM	5/6	-61	-64



	O 802.11na									
	HT20	Modulation	Code F	Pata	IFF	F Sno	o (1Dv	dRm)		
	(MCS0) BPSK	1/2		-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		-7 4 -7 0			-77			
	(MCS5) 64-QAM	2/3	-60				72			
	(MCS6) 64-QAM	3/4	-6:				71			
	(MCS7) 64-QAM	5/6	-64				67			
Sensitivity	HT40									
(1RX with	(MCS0) BPSK	1/2	-7	0			84			
+4/-2dB	(MCSI) QPSK	1/2	-7 -7(81			
	(MCS1) QFSK (MCS2) QPSK	3/4	-74 -74				01 79			
tolerance, dBm)	(MCS2) QFSK (MCS3) 16-QAM	3/4 1/2	-72 -7				19 76			
ubiii)	(MCS4) 16-QAM	3/4	-6'				70 72			
	(MCS5) 64-QAM	2/3	-6.				72 70			
	(MCS6) 64-QAM	3/4	-6. -6.				67			
	(MCS7) 64-QAM	5/4 5/6	-6.				64			
	© For transmitted			11a shall	be	less	than	-40dBr	fo	
	fc-30MHz <f<fc+30mh< td=""><td></td><td>mask for</td><td>IIa Silali</td><td>be</td><td>iess</td><td>шап</td><td>-40ubr</td><td>10</td></f<fc+30mh<>		mask for	IIa Silali	be	iess	шап	-40ubr	10	
Transmit	Example 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		mask for	11b shall	be	less	than	-50dBr	fo	
spectrum mask	fc-22MHz <f<fc+22mh< td=""><td>Hz.</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></f<fc+22mh<>	Hz.								
	② For transmitted fc-30MHz <f<fc+30mi< p=""></f<fc+30mi<>		mask for	11g shall	be	less	than	–40dBr	fo	
	② For transmitted sp	ectral mask t	Con 11 m 20MII	shall be les	. 41	45	dBr for	•		
		Jeen ai mask	OF ITH ZUMINZ	shan be les	s tnan	-45	uDi ivi	-		
	fc-30MHz <f<fc+30mh< td=""><td></td><td>IOT IIII ZUMIHZ</td><td>shall be les</td><td>s tnan</td><td><u>–</u>45</td><td>ubi ivi</td><td></td><td></td></f<fc+30mh<>		IOT IIII ZUMIHZ	shall be les	s tnan	<u>–</u> 45	ubi ivi			
		Hz.								
	fc-30MHz <f<fc+30mh< td=""><td>lz. pectral mask i</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></f<fc+30mh<>	lz. pectral mask i								
Transmit	fc-30MHz <f<fc+30mh © For transmitted sp fc-60MHz<f<fc+60mh © For 802.11a/g the</f<fc+60mh </f<fc+30mh 	Iz. pectral mask i Iz. average energ	for 11n 40MHz	shall be les	s than	–45 spect	dBr for		and	
Transmit	fc-30MHz <f<fc+30mhz +1+16="" 802.11a="" deviate="" fc-60mhz<f<fc+60mhz="" for="" g="" no<="" sp="" td="" the="" transmitted="" will=""><td>Iz. pectral mask t Iz. average energ pmore than +</td><td>for 11n 40MHz gy of the conste /- 2dB from the</td><td>shall be les llations in e ir average o</td><td>s than ach of</td><td>-45 f spect</td><td>dBr for</td><td>s –161</td><td>and</td></f<fc+30mhz>	Iz. pectral mask t Iz. average energ pmore than +	for 11n 40MHz gy of the conste /- 2dB from the	shall be les llations in e ir average o	s than ach of	-45 f spect	dBr for	s –161	and	
Transmit spectrum	fc-30MHz <f<fc+30mh For transmitted sy fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Hz. average energo more than +, node, the aver	for 11n 40MHz sy of the conste - 2dB from the age energy of t	shall be les llations in e eir average o he constella	s than ach of energy tions i	-45 f spect v. in each	dBr for ral line	s –161 ctral	and	
	fc-30MHz <f<fc+30mh For transmitted sy fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Lz. Average energonore than +, Lode, the aver Lawer will deviate	gy of the conste /- 2dB from the age energy of t e no more than	shall be les llations in e eir average o he constella +/- 2dB fro	s than ach of energy tions i	-45 f spect v. in each	dBr for ral line	s –161 ctral	and	
spectrum	fc-30MHz <f<fc+30mh For transmitted sy fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Lz. Average energonore than +, Lode, the aver Lawer will deviate	gy of the conste /- 2dB from the age energy of t e no more than	shall be les llations in e eir average o he constella +/- 2dB fro	s than ach of energy tions i	-45 f spect v. in each	dBr for ral line	s –161 ctral	and	
spectrum flatness Transmit	fc-30MHz <f<fc+30mh For transmitted sy fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Lz. Average energonore than +, Lode, the aver Lawer will deviate	gy of the conste /- 2dB from the age energy of t e no more than	shall be les llations in e eir average o he constella +/- 2dB fro	s than ach of energy tions i	-45 f spect v. in each	dBr for ral line	s –161 ctral	and	
spectrum flatness Transmit center	fc-30MHz <f<fc+30mh For transmitted sp fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+ The transmitted sp</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Lz. average energo more than +, lode, the aver 42 will deviate ectral flatness	gy of the conste /- 2dB from the age energy of t e no more than should be with	llations in e cir average o he constella +/- 2dB fro in +2/- 4dB	s than ach of energy tions i m the	-45 spect in each	dBr for ral line 1 of spe rage end	s –161 ctral	and	
spectrum flatness Transmit center frequency	fc-30MHz <f<fc+30mh For transmitted sy fc-60MHz<f<fc+60mh For 802.11a/g the +1+16 will deviate no For 802.11n 40MHz m lines -422 and +2+</f<fc+60mh </f<fc+30mh 	Hz. Dectral mask to Lz. average energo more than +, lode, the aver 42 will deviate ectral flatness	gy of the conste /- 2dB from the age energy of t e no more than should be with	llations in e cir average o he constella +/- 2dB fro in +2/- 4dB	s than ach of energy tions i m the	-45 spect in each	dBr for ral line 1 of spe rage end	s –161 ctral	and	
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	② 802.11na Modulation Code Rate IEEE Spec (1Rx dBm)					
	>-30					
	② 802.11ng Modulation Code Rate IEEE Spec (1Rx dBm)					
	>-20					
	 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 ② 802.11n: @800GI(400GI) 					
Transfer data	z 20MHz BW					
rate	1 Nss: 65(72.2) Mbps maximal 2 Nss: 130(144.444) Mbps maximal					
	z 40MHz BW					
	1 Nss: 135(150) Mbps maximal					
	2 Nss: 270(300) Mbps maximal					



4 Electrical Characteristics

4.1 Absolute maximum

The table below gives the absolute maximum value, exceed the maximum range may make the module device damaged. In order to avoid the modules and devices damaged please operate under specified conditions.

Table 4-1: parameter and range

parameters	Symbol	value	uint
The external power supply voltage	VDDIN	7~~24	V
IO maximum input voltage	3V3V _{in} IOMax	3.6	V
IO minimum input voltage	3V3V _{in} IOMin	-0.3	V
Storage temperature	$T_{ m store}$	-40 [~] +125	$^{\circ}$
Operation temperature	Toper	-20 [~] +65	°C

4.2 Recommended operating parameters

Figure 4-2 Power supply range

parameters	Symbol	minimum	Typical values	maximum	unit
Power supply	VDD	7.0	12.0	24.0	V



5 Order Information

Table 5-1: Product Models

PART NO.	Description	Volume/tray	MPQ
RAK554	Image transmission,plug and play.	12PCS/tray	60PCS





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7 Revision&History

Revision	Update	Date
V0.1	Update picture and format.	2014-07-08
V0.2	Update the contact way, Update the document format.	2014-08-22
V0.3	Updated pictures and transmit distance, modify product feature, add order info and sales services.	2014-10-22
V0.4	Update the new module picture, size and pin definitions.	2015-04-07
V0.5	Adding UART transparent transmission-related information.	2015-04-17
V0.6	Update the power supply.	2015-05-17
V0.7	Update the new module and hardware physical map marked. Update the power supply parameters.	2015-07-13
V2.0	Add the LED light instruction. And release the document.	2015-08-31
V2.1	Add the Dial-up definition. 1, Add the channel selection. 2, Add the WPS function.	2015-10-11
V2.2	Modify the PIN definition of 8PIN eGH from PWM to NC.	2015-11-11
V2.3	Add the location hole position	2016-02-29
V2.4	Delete some error description for audio and video resolution.	2016-08-25
V2.5	 Update sales and Technical Support. update module picture. 	2016-11-10
V2.6	Fixed the channel list for the switcher.	2017-03-03