

DS019510

Auk Bridge LoRaWAN Relay Datasheet

V1.1



Document information

Item	content
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Abstract	This document describes the specifications of the Auk Bridge Relay RHF3MR01

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1 Features and Applications

Features

- ◆ Built-in high-performance antenna
- ◆ Built-in 12Ah large capacity battery
- ◆ Low power
 - Sleep mode 1.9uA
- ◆ Support wireless firmware upgrade
- ◆ Install detection function
- ◆ Device status detection:
 - Real-time temperature monitoring
 - Battery voltage and capacity detection
- ◆ Diversiform downlink control interface
 - Whitelist query, binding, and unbinding
 - Blacklist query, binding, and unbinding
 - Device version, firmware information query
 - Compatible with RisingHF LAP protocol
- ◆ Supports global LoRaWAN frequency plan
 - EU868
 - US915 and US915 Hybrid
 - CN779
 - EU433
 - AU915
 - CN470 and CN470 Prequel
 - AS923
 - KR920
 - IN865

Applications

- ◆ Wireless meter reading
- ◆ Smart Home, Smart building, Smart city
- ◆ Wireless sensor network
- ◆ Wireless alarm and security
- ◆ Industry 4.0, Industrial monitor
- ◆ environment monitor

2 Product overview

2.1 overview

RHF3MR01 is a brand-new LoRaWAN product launched by RisingHF. In the actual application scenario of LoRaWAN, there are problems such as signal instability and no signal in some areas. RHF3MR01 has an ultra-high cost performance in blind spot coverage applications.

RHF3MR01 is easy to use and install, with its own installation detection function, which is convenient for users to choose a suitable installation location.

RHF3MR01 adopts ABS + PC material shell, which has the characteristics of high temperature resistance and corrosion resistance. Waterproof rating up to IP67, built-in large-capacity battery and high-performance antenna, fully suitable for outdoor installation.

2.2 Interface description

Table 2-1 device interface

Interface	Description
KEY	Used to activate or sleep the device, please refer to UM119510 for more information
LED	Indicate key value and device working status, please refer to UM119510 for more introduction

3 Electrical Performance

3.1 Consumption

Table 3-1 Consumption

Item	Condition	Typ	Unit
Sleep current		1.9	uA
TX current	20dBm, 410~525MHz	120	mA
	14dBm, 860~1020MHz	45	mA
RX current	BW125kHz, 410~525MHz	16	mA
	BW125kHz, 860~1020MHz	15.5	mA

3.2 Battery Performance

Due to the nature of the battery itself, the battery capacity will decrease in low temperature environments.

Table 3-2 Battery performance

	Environment temperature	Typ	Unit
Capacity	-20°C	8200	mAh
	0°C	9800	mAh
	25°C	12000	mAh
	60°C	12000	mAh
Annual self-discharge Rate	25°C	<2%	

3.3 RF performance

3.3.1 Output Power

Test condition: +25°C

Table 3-3 TX Performance Test @ 470MHz-510MHz

Freq/MHZ	465	470	475	480	485	490	495	500	505	510
Txop/dBm	18.89	18.63	18.7	18.61	18.53	18.6	18.85	18.68	18.75	18.8
H2/dBm	-50	-48	-46	-45	-44	-44	-45	-45	-46	-46
H3/dBm	-49	-50	-50	-50	-51	-51	-52	-52	-52	-53
H4/dBm	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60
H5/dBm	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60	<-60

Table 3-4 TX Performance Test @ 902MHz-928MHz

Ferq/MHZ	902	906	910	914	918	922	926	928
Txop/dBm	13.96	14.03	13.96	14.04	13.93	13.93	13.93	13.92
H2/dBm	-48	-47	-47	-47	-47	-48	-48	-48
H3/dBm	<60	<-60	<-60	<-60	<-60	<-60	<-60	-60

3.3.2 Receive Sensitivity

Test condition: +25°C

Table 3-5 Receive Sensitivity Test @ 470MHz~490MHz

Freq/MHZ	470	475	480	485	490
SF12	-139	-138	-138.5	-138.5	-138.5
SF11	-135.5	-136	-136	-136.5	-135
SF10	-132	-132	-133	-132	-132
SF9	-129.5	-129.5	-129	-129	-129
SF8	-127	-126.5	-126.5	-126.5	-126.5
SF7	-123	-123	-123	-123	-123

Table 3-6 Receive Sensitivity Test @ 902MHz~928MHz

Freq/MHZ	902	906	910	914	918	922	926	928
SF12	-138.5	-138.5	-138	-138	-138	-138	-138	-138
SF11	-135.5	-135.5	-135	-136	-135	-135	-135	-135
SF10	-132.5	-132.5	-132	-132	-132	-132	-132	-132
SF9	-129	-129	-129	-129	-129	-129	-129	-129
SF8	-127	-127	-127	-127	-126.5	-126.5	-126.5	-126
SF7	-124	-123.5	-123.5	-124	-123.5	-123.5	-123	-123

3.3.3 Temperature characterisitc

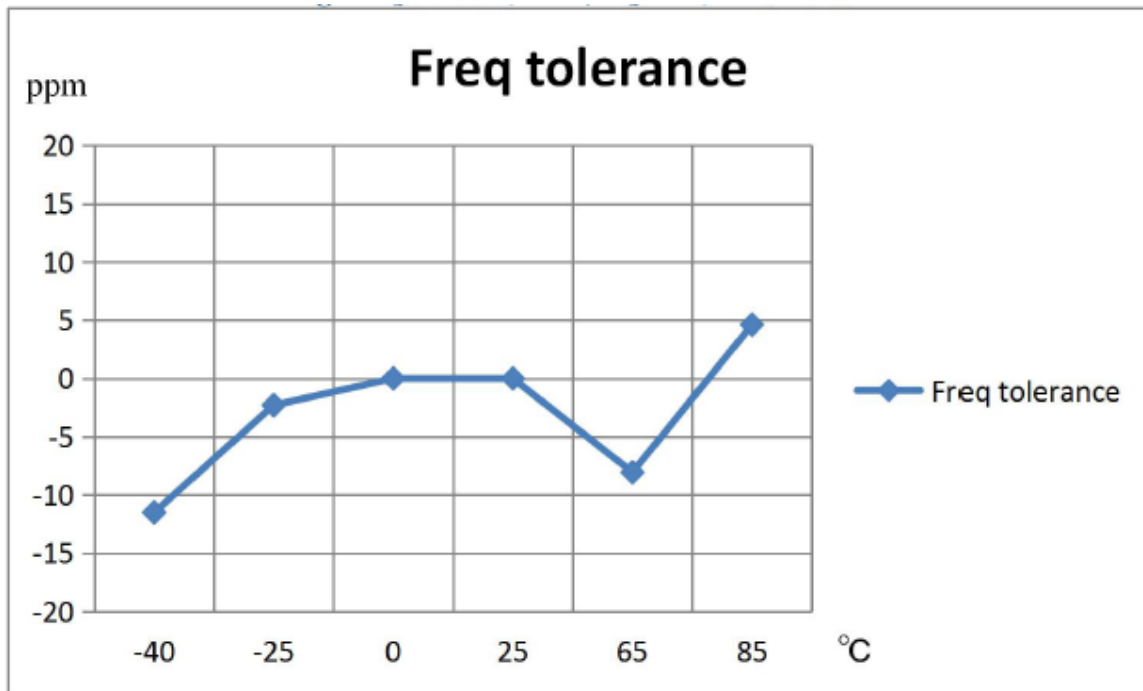


Figure 3-1 Frequency VS Temperature

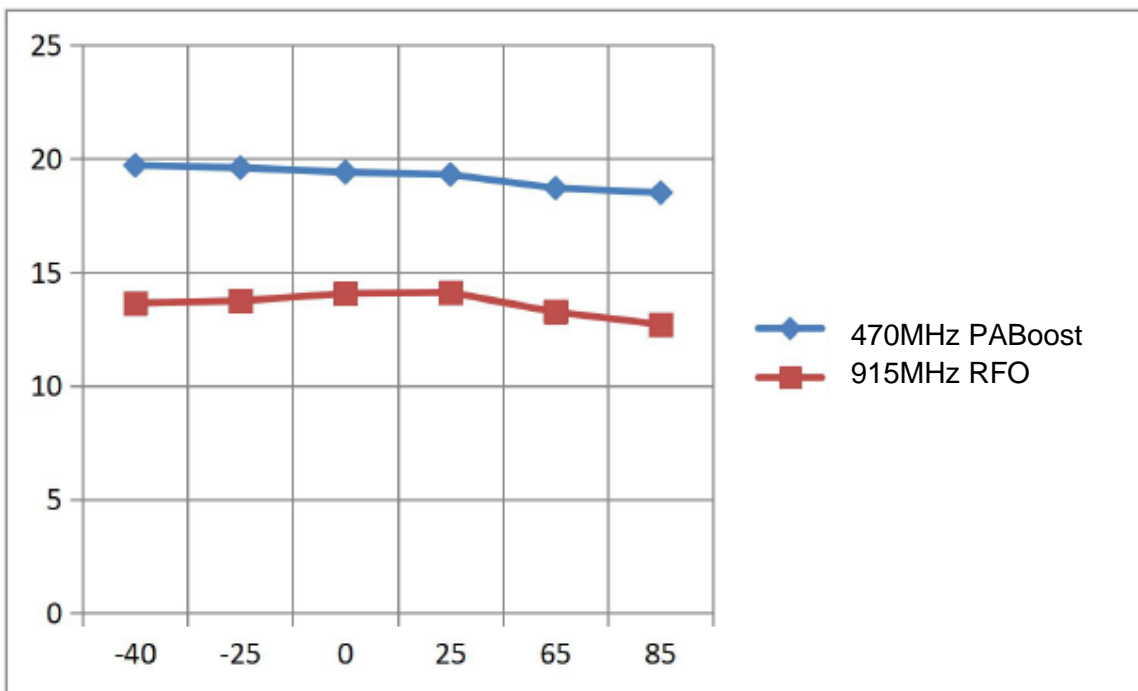


Figure 3-2 Output power VS Temperature

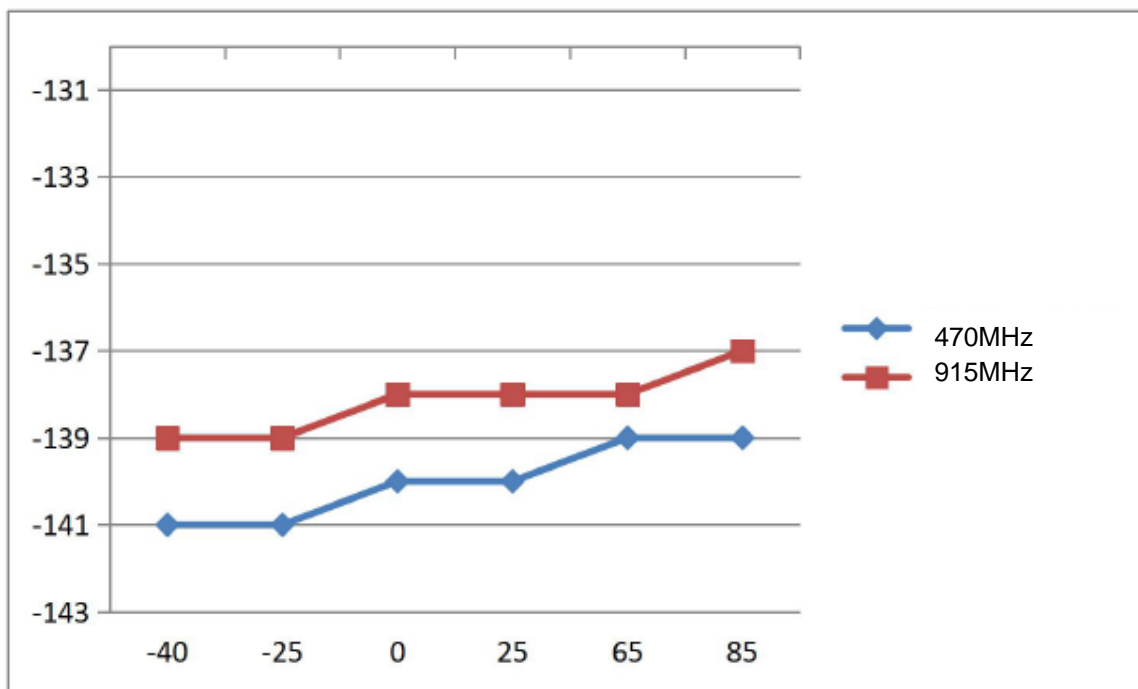


Figure 3-3 Receive sensitivity (SF=12, BW=125K) VS Temperature

3.4 Antena performance

The product has a built-in high-performance PIFA antenna. Different frequency configurations are equipped with different antennas.

Table 3-7 RHF3MR01-470 antenna performance

Freq(MHz)	470	475	480	485	490	495	500	505	510
VSWR	2.17	1.82	1.40	1.08	1.13	1.37	1.74	1.96	2.22
Gain(dBi)	-0.14	0.88	2.28	2.58	1.73	0.72	-0.84	-1.48	-0.71
Efficiency %	32.21	42.63	54.14	61.07	57.69	45.94	35.88	30.95	30.35

Table 3-8 RHF3MR01-868 antenna performance

Freq(MHz)	860	870	880	890	900	910	920	930
VSWR	1.39	1.47	1.55	1.63	1.73	1.85	1.96	2.13
Gain(dBi)	1.78	2.10	2.28	2.22	2.28	1.58	1.67	2.54
Efficiency %	75.43	76.53	71.83	72.87	70.90	65.14	65.05	65.39

3.5 Mechanical characteristics

3.5.1 Drop performance

The product is free to fall from a height of 1 meter at any angle. Due to the nature of the shell material, the impact surface of the shell will be slightly depressed, but it will not affect the internal components of the product and will not affect the normal use of the product.

3.5.2 Waterproof performance

The product adopts special waterproof technology, and the waterproof grade can reach IP68. When you use this product, it is forbidden to disassemble the shell without permission, so as not to affect its waterproof performance.

4 Product size and packaging information

4.1 Product size

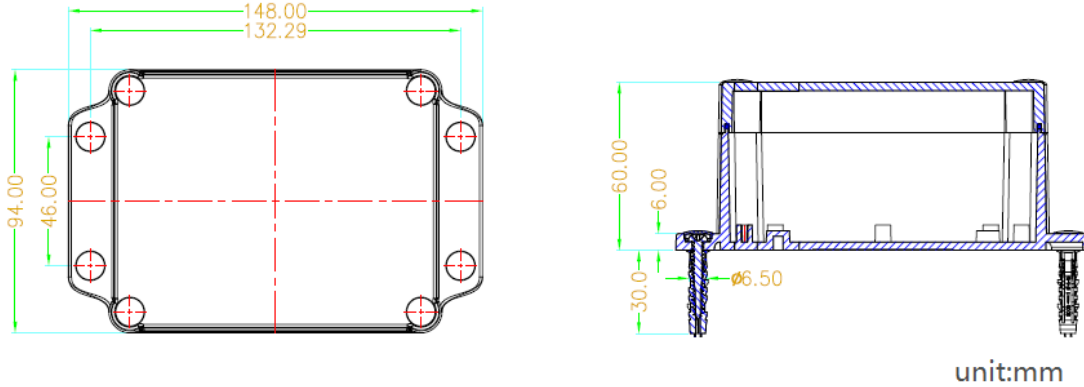


Figure 4-1 RHF3MR01 Mechanical Dimensions

4.2 Packaging information

4.2.1 packing list

Table 4-1 packing list

Component	Description	Qty.
RHF3MR01	device	1
self-tapping screw	Used for device installation and fixation	4
expansion screw	Used for device installation and fixation	4
plastic cap	Used to protect screws	4

4.2.2 Packaging information



Figure 4-2 package inside



Figure 4-3 package

5 Ordering information

RHF3MR01 contains multiple sub-models, different sub-models correspond to different frequency bands and regions of use, please contact sales@risinghf.com for more details.

Table 5-1 ordering information

Part Number	Battery Capacity	Max. Tx Power (dBm)	备注
RHF3MR01-CN470ALID	12Ah	20	-
RHF3MR01-CN470	12Ah	20	-
RHF3MR01-EU868	12Ah	14	-
RHF3MR01-US915	12Ah	14	-
RHF3MR01-AS923	12Ah	14	-
RHF3MR01-IN865	12Ah	14	-
RHF3MR01-AU915	12Ah	14	-

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