

DS11825

LoRaWAN IOT 工业网关 RHF2S025 产品规格书

V0.2



Document information

Info	Content
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Abstract	本手册描述 RisingHF 开发集成 WiFi 的 LoRaWAN 网关设备 RHF2S025 的技术指标和规格。

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2.2. 产品特点和应用领域

特点:

- ✓ LoRaWAN 半双工/全双工通信模式;
- ✓ 上行支持 8 个并行 Multi-SF LoRa 信道, 1 个 Single-SF LoRa 信道, 1 个高速 GFSK 信道;
- ✓ 发射功率最高达 25dBm, 接收机灵敏度达到-142dBm@300bps;
- ✓ 支持 LoRaWAN ClassA/C 协议;
- ✓ 支持 802.11 b/g/n 无线协议;
- ✓ 支持 10/100M 以太网口和 WIFI 连接上网;
- ✓ 支持 100m 以内网线;
- ✓ 支持 LTE 4G (部分型号);

- ✓ 无线传感器网络
- ✓ 无线水表、电表、气表、热表数据采集
- ✓ 工业 4.0, 工业设备监控
- ✓ 无线远程监控
- ✓ 智能家居, 智慧楼宇, 智慧社区, 智慧城市
- ✓ 无线报警和安防系统
- ✓ 环境数据监控

应用:

- ✓ M2M, IOT 物联网, 低功耗广域网 LPWAN

2.3. 技术规格概述

Table 2-1 RHF2S025 技术规格概述

Item	项目名称	功能描述
系统配置	内核	MIPS24KEc
	主频	580MHZ
	RAM	1G-bit
	Flash	256M-bit
通信方式	10M/100Mbps 以太网接入	互联网有线接入

	LTE 4G 接入(部分型号)	互联网无线接入
	2.4-2.4835G WIFI	互联网无线接入
	470-510MHZ LoRa	LoRa 设备无线接入, 上行 470-490MHZ, 下行 470-510MHZ
无线覆盖范围	WiFi	60 米
	LoRa	3 千米(城市环境)
电气性能指标	输入电压	直流 12V
	平均功耗典型值	<5W
	2.4G WiFi 输出功率	11n: 16dBm 11g: 16dBm 11b: 19dBm
	2.4G WiFi 接收灵敏度	11n HT20 MCS7 150Mbps: -68dBm@10%PER 11g 54Mbps: -68dBm@10%PER 11b 11Mbps: -85dBm@8%PER
	LoRa 输出功率	17dBm@470MHz Max: 25dBm
	LoRa 接收灵敏度	-142dBm@SF12, BW=125kHz
LED 指示	LTE 4G LED(部分型号)	LTE 4G 模块工作状态指示
	POWER LED	电源接入指示
	SYSTEM LED	系统运行状态指示

	WiFi LED	WIFI 连接状态指示
	LoRa LED	LoRa 连接状态指示
	USB LED	USB 连接状态指示
	RJ45 LED	有线网口连接指示
外部接口	RJ45 以太网口	WAN 口/LAN 口不同模式下自动切换
	USB2.0	本地固件升级及数据下载
	WiFi 天线	5dBi 外置可拆天线
	LoRa 天线	0dBi 外置可拆天线
	LTE 4G 天线(部分型号)	4dBi 外置可拆天线
	SIM 卡接口(部分型号)	支持标准 SIM 卡大卡 (25mm*15mm*0.8mm)
	DC 电源接口	12V/1.5A 电源供电
机械尺寸及安装	尺寸	155*138.5*33.5mm
	重量:	500g
	安装方式	水平放置或挂墙安装

工作环境	工作温度	-20 to +65°C
	储存温度	-40 to +85°C

3. 电气性能及可靠性要求

3.1. 电气性能

3.1.1. 供电

RHF2S025 配备 12V/1.5A 五级能效电源适配器，输入电压范围 90~264Vac；50~60HZ，输出电压范围 11.4~12.6V

3.1.2. 功耗

Table 3-1 RHF2S025 整机功耗

项目	数值 typ/W
待机功耗	1.9W
平均典型功耗	4.3W
最大功耗	5W

3.1.3. RF 性能（LoRaWAN）

整机性能主要用传导接收灵敏度和传导发射功率两个指标来衡量。

1) 传导接收灵敏度

测试条件：32byte payload，PER=10%，常温+25°C。

Table 3-2 传导接收性能指标

Part Number	Bandwidth/kHz	Spreading Factor	Sensitivity/dBm
RHF2S025-470	125	12	-140
		7	-125
	250	12	-136
		7	-122
	500	12	-133
		7	-119
RHF2S025-868	125	12	-139
		7	-125
	250	12	-136
		7	-122

	500	12	-133
		7	-119
RHF2S025-915	125	12	-139
		7	-125
	250	12	-136
		7	-122
	500	12	-133
		7	-119

2) 传导发射功率

测试条件：CW 信号发射，常温+25℃。

Table 3-3 传导发射性能指标

Part Number	Parameter	Min	Typ	Max	Unit
RHF2S025-470	Frequency Range (Tx)	470		510	MHz
	Frequency Range (Rx)	470		490	MHz
	Max Output power		25		dBm
	Output Power Variation	-1.5		1.5	dB
	TX Power Variation Temperature (-20 to 65℃)	-1		1	dB
	TX Frequency Variation Temperature (-20 to 65℃)	-3		3	ppm
	TX Frequency Variation Temperature (-20 to 65℃)	-3		3	ppm
RHF2S025-868	Frequency Range (Rx/Tx)	859		871	MHz
	Max Output power		25		dBm
	Output Power Variation	-1.5		1.5	dB
	TX Power Variation Temperature (-20 to 65℃)	-1.5		1.5	dB
	TX Frequency Variation Temperature (-20 to 65℃)	-3		3	ppm
RHF2S025-915	Frequency Range (Rx/Tx)	900		930	MHz
	Max Output power		25		dBm
	Output Power Variation	-1.5		1.5	dB
	TX Power Variation Temperature (-40 to 65℃)	-1.5		1.5	dB
	TX Frequency Variation Temperature (-40 to 65℃)	-3		3	ppm

3.1.4. 天线性能

网关标配高效率 50Ω 全向天线。

Table 3-4 天线性能指标

	WiFi	LoRa		LTE 4G	
		470MHz	868MHz/915MHz	国内版	美国版及欧洲版
VSWR	<1.9	<1.7	<2.9	<3.5	<3.7
增益(dBi)	6	2	3.5	4	0.5
效率	50%	70%	85%	80%	50%

3.1.5. LoRa 功率配置表

1) CN470

Table 3-5 CN470 功率配置表

CN470	Power	DIG	MIX	PA
0	-2	3	8	0
1	1	3	10	0
2	3	3	12	0
3	4	3	15	0
4	5	0	15	0
5	8	3	8	1
6	10	0	8	1
7	14	0	13	1
8	15	3	8	2
9	17	3	9	2
10	19	0	8	2
11	20	0	9	2
12	21	0	10	2
13	23	0	14	2
14	24	3	10	3
15	25	0	9	3

2) EU868/IN865

Table 3-6 EU868/IN865 功率配置表

EU868	Power	DIG	MIX	PA
0	-1	0	8	1
1	2	0	10	1
2	5	0	12	1
3	6	0	8	2

4	8	0	9	2
5	9	0	10	2
6	11	0	11	2
7	12	0	12	2
8	14	0	13	2
9	15	0	8	3
10	17	0	9	3
11	18	0	10	3
12	20	0	11	3
13	22	0	12	3
14	23	0	13	3
15	24	0	15	3

3) US915/AU915/AS923

Table 3-7 US915/AU915/AS923 功率配置表

US915	Power	DIG	MIX	PA
0	-2	0	15	0
1	1	0	8	1
2	4	0	10	1
3	6	0	12	1
4	7	0	13	1
5	8	0	8	2
6	10	0	9	2
7	11	0	10	2
8	13	0	11	2
9	14	0	12	2
10	15	0	15	2
11	17	0	8	3
12	19	0	9	3
13	20	0	10	3
14	22	0	12	3
15	24	0	14	3

3.2. 可靠性要求

3.2.1. 环境试验要求

Table 3-8 环境试验要求

项目	测试条件	标准	结果
低温工作	Temperature: -20°C Operation mode: working with service connected Test duration: 12 h	JESD22-A1 GB/T 2423	外观良好; LoRaWAN RF 性能良好; 其他功能正常;
高温工作	Temperature: +65°C Operation mode: working with service connected Test duration: 12 h	JESD22-A1 GB/T 2423	外观良好; LoRaWAN RF 性能良好; 其他功能正常;
低温储存	Temperature: -40°C Operation mode: no power, no package Test duration: 24 h	JESD22-A1 GB/T 2423	外观良好; LoRaWAN RF 性能良好; 其他功能正常;
高温储存	Temperature: +85°C Operation mode: no power, no package Test duration: 24 h	JESD22-A1 GB/T 2423	外观良好; LoRaWAN RF 性能良好; 其他功能正常;

3.2.2. EMC 及 ESD 可靠性要求

RHF2S025 是一款高可靠性工业网关设备，依据 IEC61000-4 标准进行了静电防护 ESD 测试，快速脉冲群抗干扰测试，浪涌抗干扰测试等。

Table 3-9 可靠性要求

Item	Standard	Test condition
ESD	IEC 61000-4-2	Air Discharge:10kV Contact Discharge:6kV Positive/Negative
EFT/Burst	IEC 61000-4-4	AC power port:1k(peak) 5/50ns Tr/Th 5KHZ Repetition Freq.
surge	IEC 61000-4-5	Common mode: 3kV Differential mode: 3kV Positive/Negative

4. 机械尺寸、包装以及订购信息

4.1. 机械尺寸

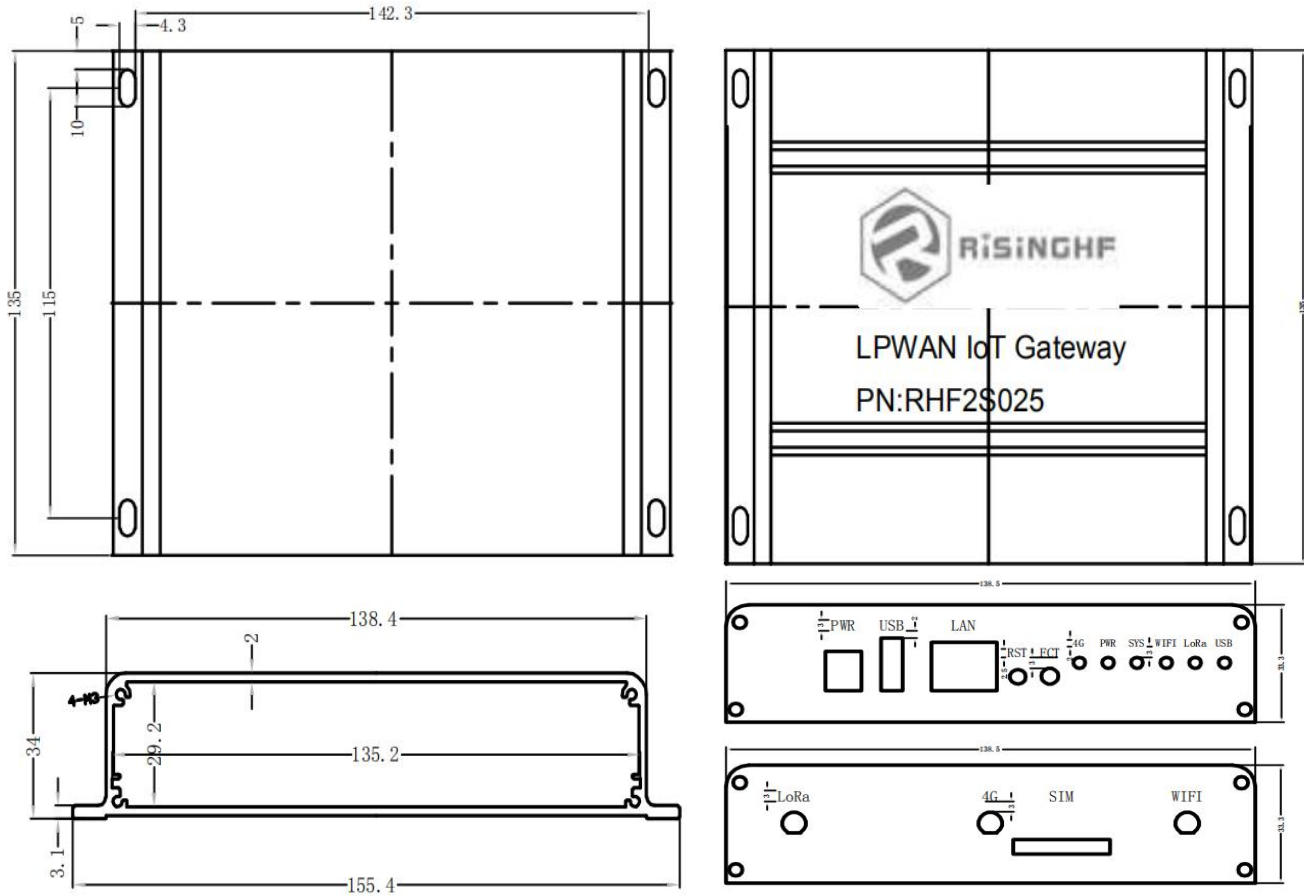


Figure 4-1 RHF2S025 机械尺寸图

4.2. 包装信息

4.2.1. 包装清单

Table 4-1 包装清单

物品名称	规格	数量
RHF2S025 整机	RHF2S025xxx-xxx	1
电源适配器	12V/1.5A	1
WiFi 天线	6dBi 高效率全向天线	1
LoRa 天线	高效率全向天线	1
4G 天线(部分机型)	高效率全向天线	1

4.2.2. 包装信息



Figure 4-2 RHF2S025 外包装



Figure 4-3 包装内衬

4.3. 订购信息

RHF2S025 有多个产品型号，对应不同区域的频段，请订购时与 RisingHF 的销售人员沟通。

Table 4-2 订购信息

序号	产品系列	规格型号	Band@Uplink	Band@Downlink	产品特点
1	RHF2S025AH8	RHF2S025AH8-470	470MHz~490MHz	470MHz~510MHz	No LTE/半双工
		RHF2S025AH8-868	859MHz~871MHz	859MHz~871MHz	No LTE/半双工

		RHF2S025AH8-915	900MHz~930MHz	900MHz~930MHz	No LTE/半双工
2	RHF2S025BH8	RHF2S025BH8-470	470MHz~490MHz	470MHz~510MHz	LTE/半双工
		RHF2S025BH8-868	859MHz~871MHz	859MHz~871MHz	LTE/半双工
		RHF2S025BH8-915	900MHz~930MHz	900MHz~930MHz	LTE/半双工
3	RHF2S025AF8	RHF2S025AF8-470	470MHz~490MHz	500MHz~510MHz	No LTE/全双工
		RHF2S025AF8-AL1	470.2MHz~476.6MHz	483.8MHz~490.2MHz	No LTE/全双工
		RHF2S025AF8-915	902MHz~915MHz	923MHz~928MHz	No LTE/全双工
4	RHF2S025BF8	RHF2S025BF8-470	470MHz~490MHz	500MHz~510MHz	LTE/全双工
		RHF2S025BF8-AL1	470.2MHz~476.6MHz	483.8MHz~490.2MHz	LTE/全双工
		RHF2S025BF8-915	902MHz~915MHz	923MHz~928MHz	LTE/全双工

修订版本

V0.2 2019-04-01

1 变更首页图片

2 变更网关工作温度范围

V0.1 2019-03-18

+ 建立文档

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