

# DS11843

## RHF4T003 手持路测仪数据手册

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V1

### Document information

Info	Content
<b>Keywords</b>	RHF4T003, LoRaWAN ,射频性能、电池放电曲线
<b>Abstract</b>	本文档是 RHF4T003 手持路测仪的规格书

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## 描述

RHF4T003 是一款基于标准 LoRaWAN 无线通信协议的信号质量测试仪器。自动切换入网模式，LCD 显示屏实时显示当前数据收发状态、信号质量及当前位置 GPS 信息。当前信号的 RSSI、SNR

LinkMargin 及 GPS 信息会实时保存在内置存储卡中供用户进一步分析。

本规格书主要描述手持路测仪的相关性能和应用信息



Top view

## 应用

手持路测仪主要应用于 LoRa 网络现场施工的测试，LoRa 和 LoRaWAN 在实际使用的现场工程布设过程中，指导相关人员进行网络规划和网络优化或评估网络规划的质量。

## 主要特点

### ◆ 主要功能:

支持 LoRa/LoRaWAN 通信

LCD /uplink rssi snr/downlink rssi snr

GPS 精准定位，定位数据上传到云端

环境温度实时检测

高精度薄膜按键，多种参数可以配置

直接计算丢包率

### ◆ 高性能:

RHF0M003-LF20:

TXOP=20dBm@434MHz/470MHz

RHF0M003-HF20:

TXOP=20dBm@868MHz/915MHz

### ◆ 支持全球 LoRaWAN 频率计划:

EU868;

US915 and US915 Hybrid;

CN779;

EU433;

AU915;

CN470 and CN470 Prequel;

AS923;

KR920;

IN865;

### ◆ 接口: MINI USB 接口

### ◆ 续航能力: 连续工作超过8H

### ◆ 存储: 8G sd 卡

### ◆ 电池容量: 1150mAh

### ◆ 尺寸: 167\*67\*27mm

# 1 概述

RHF4T003 手持路侧仪内嵌 RHF0M003-LF20 和 RHF0M003-HF20 LoRa 模组，可实现 20dBm@LF band (434MHz/470MHz) 和 20dBm@HF band(868MHz/915MHz)自由切换。内置高精度 GPS 模块能实时捕获当前经纬度信息进行精准定位。内置温度传感器能精准检测当前环境温度变化。LCD 彩屏可以显示时间、电池电量、SD 卡状态等信息，测试模式下，LoRa 数据收发情况、downlink rssi snr、GPS 信息等会实时在 LCD 彩屏显示，用户可以通过屏幕信息判断当前测试效果，通过当前的测试结果，综合评估网关部署的位置、节点部署的位置是否达到最优。

## 1.1 原理框图

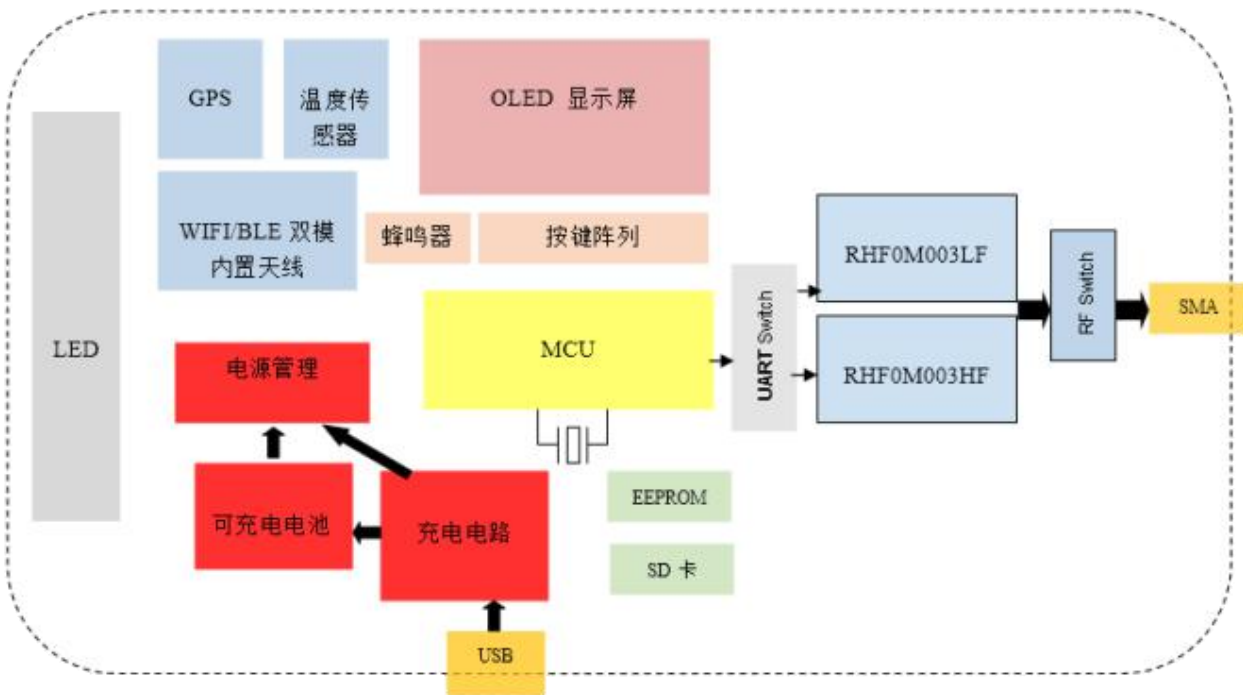


图 1 原理框图

# 2 电气性能

## 2.1 常规工作条件

Item	Description	Min	Typ	Max	Unit
VCC	工作电压	3.0	3.7	5.0	V
I $\alpha$	平均工作电流	/	130	/	mA
I <sub>c</sub>	充电电流		800	1000	mA
V <sub>c</sub>	充电电压	4.2	5	5.5	V
T <sub>1mr</sub>	工作温度	-20	/	+70	°C
T <sub>2mr</sub>	储藏温度	-40	/	+85	°C
P <sub>mr</sub>	射频输入信号			+10	dBm

表 1 常规工作条件

## 2.2 极限工作条件

Item	Description	Min	Max	Unit
VCC	工作电压	-0.3	5.5	V
Ic	充电电流		1.2	A
Vc	充电电压	3.8	6	V
Pmr	射频输入信号		+10	dBm

表 2 极限工作条件

## 3 产品规格

Items	Parameter	Specifications	Unit	
硬件	功能模块	LoRa 模组、GPS 模组、WIFI/BLE 模组		
	传感器	温湿度传感器		
	内核	STM32476X		
	时钟	12MHz		
	封装尺寸	167*67*27	mm	
	接口	Mini USB		
	供电方式	可充电内置锂电池		
	存储	SD 存储卡		
	待机电流 (息屏)	21.8	mA	
	关机漏电流	36	uA	
	发射功率		20dBm max@434MHz/470MHz	dBm
			20dBm max @868MHz/915MHz	dBm
	接收灵敏度		-139dBm @SF12, BW125kHz, 434MHz/470MHz	dBm
			-137dBm @SF12, BW125kHz, 868MHz/915MHz	dBm
GPS 首次定位时间 (开阔环境)		30	s	
ESD	接触放电	±4KV		
	空气放电	±4kV		
软件	系统	RT Thread 系统		
	固件升级	USB 串口升级		
	用户配置	HFT_Config_tool.exe		
	SD 卡文件系统	FAT32		

表 3 产品规格

## 4 典型射频性能

### 4.1 434MHz/470MHz 射频性能

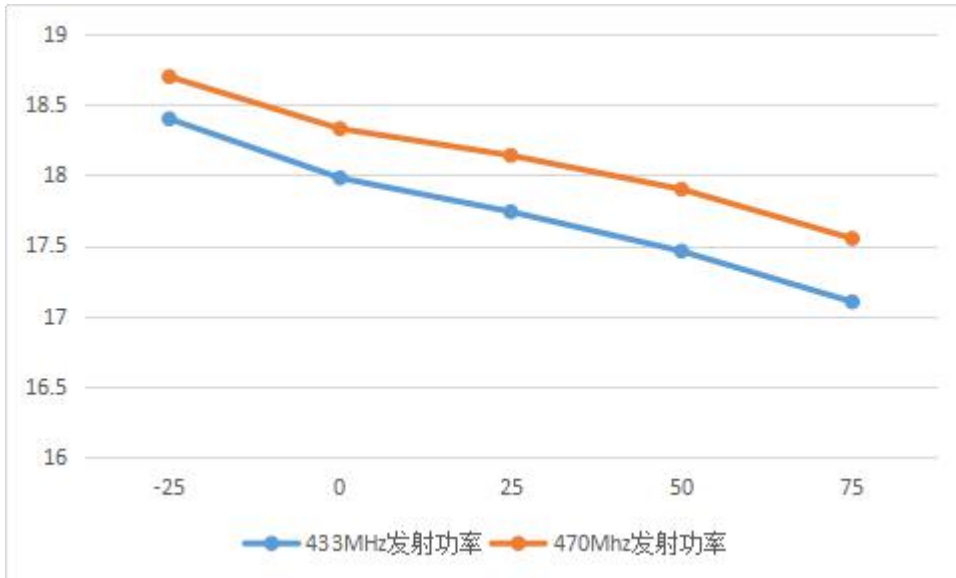


图 2 发射功率 vs 环境温度

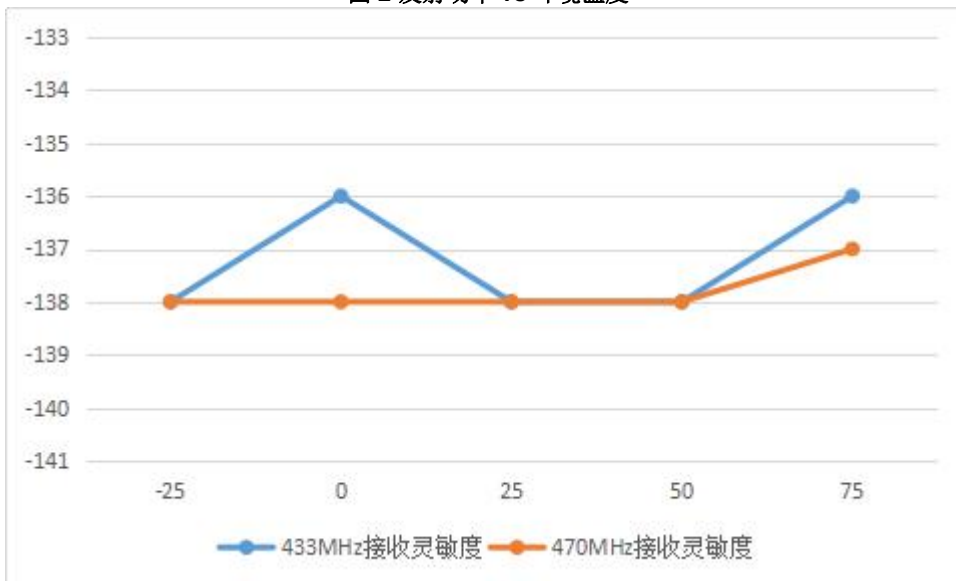


图 3 接受灵敏度 (SF12,125kHz) vs 环境温度

### 4.2 868MHz 射频性能

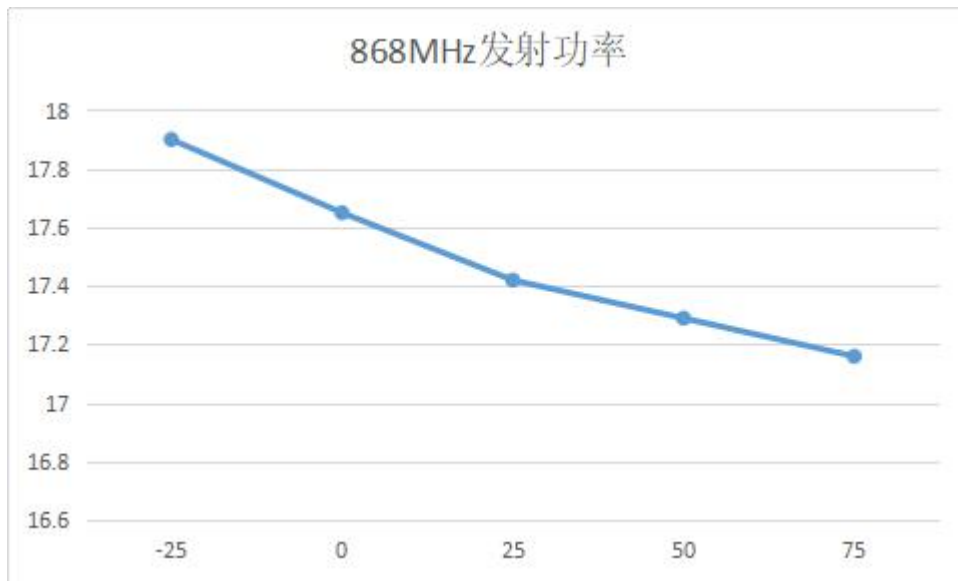


图 4 发射功率 vs 环境温度

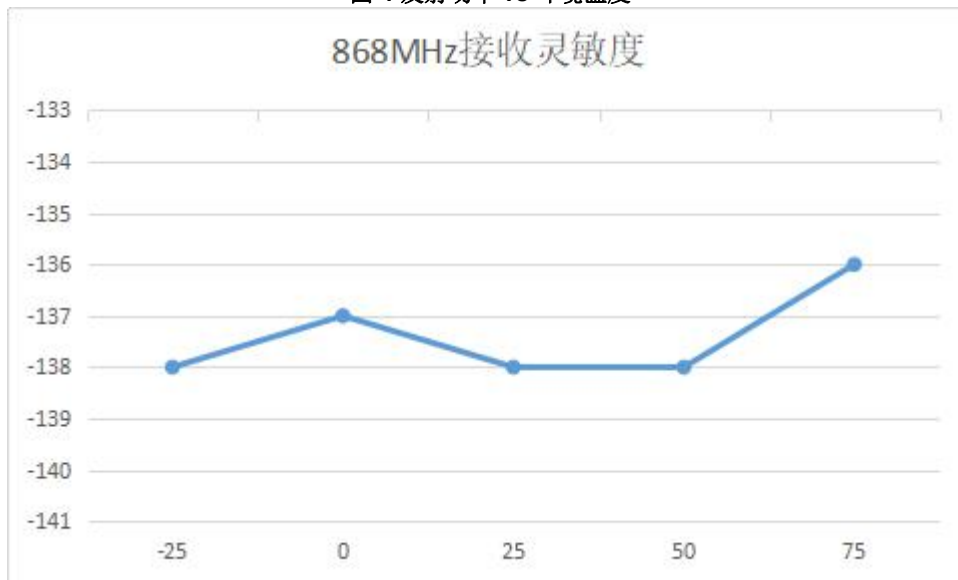


图 5 接收灵敏度 (SF12,125kHz) vs 环境温度

## 5 电池放电曲线

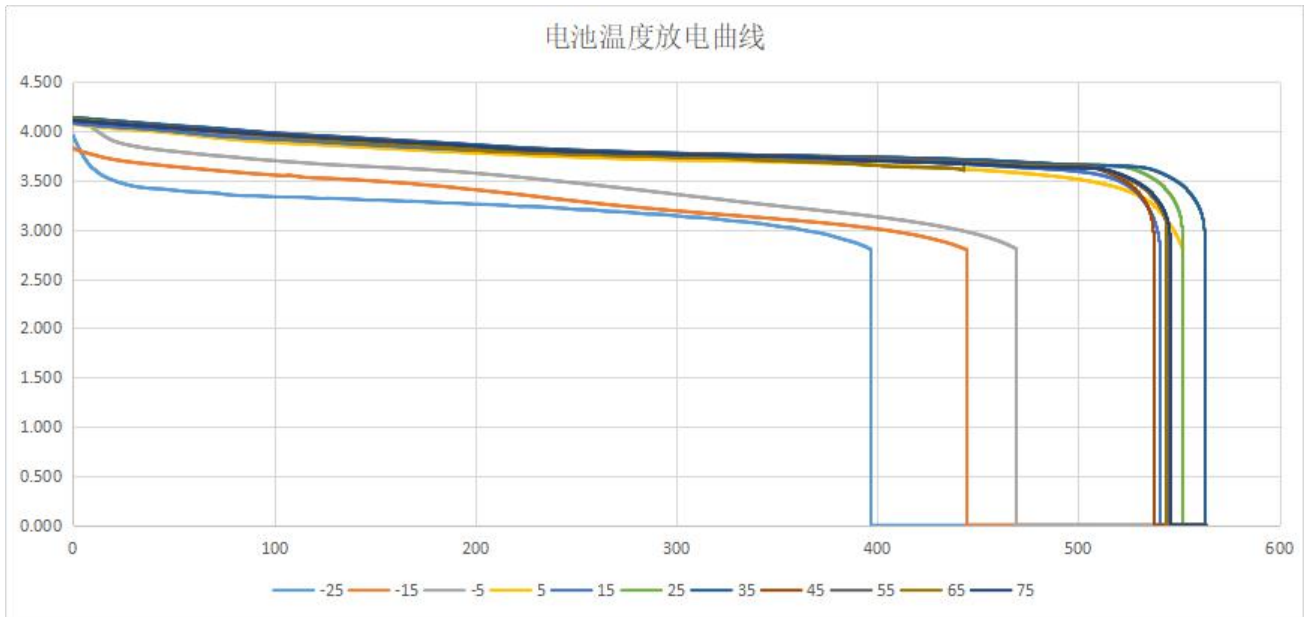


图 6 电池温度放电曲线

## 6 天线性能

### 6.1 433MHz 天线参数

Frequency	E Total. dB(dBi)	Efficiency( )	SWR
430MHz	0.73	72%	1.59
433MHz	1.02	77%	1.37
434MHz	1.09	78%	1.31
436MHz	0.98	75%	1.18
437MHz	N/A	N/A	1.10
440MHz	0.92	75%	1.07

表 4 433MHz 天线参数

### 6.2 470MHz 天线参数

Frequency	E Total. dB(dBi)	Efficiency( )	SWR
470MHz	0.74	72%	1.81
480MHz	0.90	75%	1.32
490MHz	0.27	69%	1.33
500MHz	0.13	61%	1.64
510MHz	0.02	57%	1.91

表 5 470MHz 天线参数

### 6.3 868MHz 天线参数

Frequency	E Total. dB(dBi)	Efficiency( )	SWR
868MHz	0.57	51%	1.71
878MHz	0.96	55%	1.48
888MHz	0.96	55%	1.33
898MHz	0.82	53%	1.50
908MHz	0.91	51%	1.83
915MHz	0.96	51%	2.16

表 6 868MHz 天线参数

## 7 外形



外形尺寸：167\*67\*27mm (不含天线)

## 8 订购信息

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## **Revision**

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