客 户 宝 号: _____

Travelling Merchant

DATASHEET

品名规格: **RM-7601**

Standard _____

编号: 15-0828

P/N _____

出图 Plot			承认印 The Label
制图 Drew	审核 Audited	核准 Approved	请于承认签章 谢谢! Stamp, please! Thanks!
日期: Date:			

广东大普通信技术有限公司

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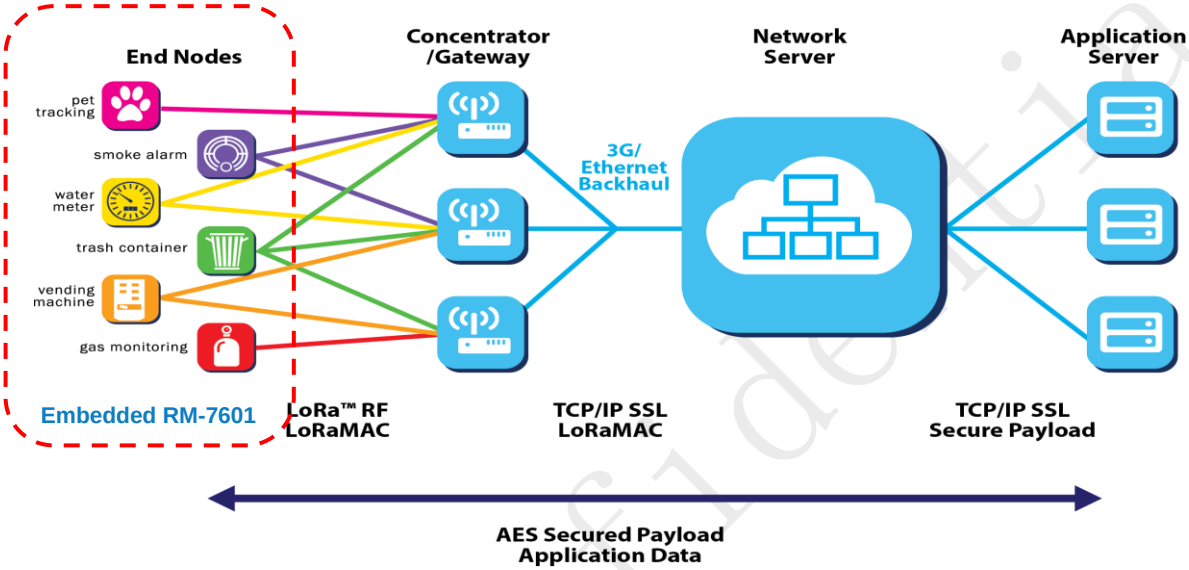
DAPU TELECOM
The Partner of High Quality of Radio Frequency Solutions

LoRa™ Alliance
wide area network for IoT

RM-7601

Long Range & Low Power
434/470/868/915MHz
LoRa™ Module



INTRODUCTION

The RM-7601 is a secure, CE/FCC certified ,low-power RF module, that provides long-range, low bit rate transmitting data to RF applications.

With Class A functionality implemented, the RM-7601 is LoRaWAN™ 1.0 compliant. By using sub-GHz ISM bands, the RM-7601 providing bi-directional data communication up to 15 km line-of-sight and over 2 km into harsh environment.

The secure transmission with security protocols such as 'Packet engine up to 256 bytes with CRC', the long battery by fitting with ultra low power consumption transceiver and MCU, the easier connectivity with superior transmit power and receive sensitivity.

FEATURES

◇LoRa™ Modem
◇168 dB maximum link budget
◇+20 dBm- 100 mW constant RF output vs. V supply
◇+14 dBm high efficiency PA
◇Programmable bit rate up to 300 kbps
◇High sensitivity: down to -148 dBm
◇Bullet-proof front end: IIP3 = -11 dBm
◇Excellent blocking immunity
◇Low RX current of 9.9 mA, 200 nA register retention
◇Fully integrated synthesizer with a resolution of 61 Hz
◇FSK, GFSK, MSK, GMSK, LoRa™ and OOK modulation
◇Built-in bit synchronizer for clock recovery
◇Preamble detection
◇127 dB Dynamic Range RSSI
◇Automatic RF Sense and CAD with ultra-fast AFC
◇Packet engine up to 256 bytes with CRC

APPLICATIONS

- Automated Meter Reading
- Home and Building Automation
- Wireless Alarm and Security Systems
- Industrial Monitoring and Control
- Long range Irrigation Systems
- Other M2M Systems

1. 工作参数 Running Parameters

型号 MODEL ： **RM-7601**						
指标描述 Description		指标 Parameters			单位 Unit	测试条件 Test Condition
		最小值 Min.	典型值 Typ.	最大值 Max.		
供电电压 Supply voltage		2.4	3.3	3.7	V	
工作温度 Operational temperature range		-40	XX	85	℃	
电流特性 Power consumption	休眠模式 Sleep Idle	XX	2	XX	uA	
	待机模式 Standby	XX	2	XX	mA	
	接收 Receive Mode	XX	12	XX	mA	
	发射 Transmit Mode	XX	110	XX	mA	
晶振频率 Crystal oscillator frequency		XX	32	XX	MHz	
制式 Modulation		FSK/LoRa				
通信芯片 Transceiver		SX1276				
MCU		STM32L151C8U6				

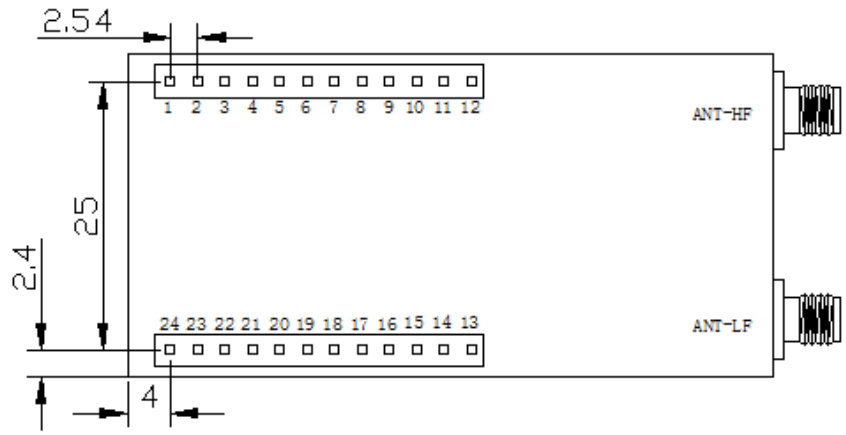
2. 性能指标 Performance Parameters

指标描述 Description	指标 Parameters	单位 Unit
工作频率 Frequency Range	137~1020	MHz
扩频 Spread Frequency	6~12	
带宽 Bandwidth	7.8~500	KHz
有效波特率 Effective Bitrate	0.018~37.5	kbps
灵敏度 Est. sensitivity	-110~-148	dBm
发射功率 Standby	10~19	dBm
数据包传输 Packet engine	256 bytes with CRC	

3.PIN 示意图及外观图 Pin Diagram & Package Marking

	相连引脚号/ Connected pin No.			
RF 板/Board	SX1276	STM32L151C8U6	引脚定义/Pin definition	说明/Description
	7	21	RF_NRESET	
	8	22	RF_DIO0	
	9	2	RF_DIO1	
	10	46	RF_DIO2	
	11	40	RF_DIO3	
	12	39	RF_DIO4	
	13	38	RF_DIO5	
	16	15	RF_SCK	
	17	16	RF_MISO	
	18	17	RF_MOSI	
	19	14	RF_NSS	
	20	13	RF_RXTX	
		11	RF_FEM_CPS	ANT_LF 射频开关控制使能端口 /ANT_LF Enable port
		10	RF_FEM_CTX	ANT_HF 射频开关控制使能端口 /ANT_HF Enable port
1		42	I2C1_SCL	
2		43	I2C1_SDA	
3		19	PB1_ADC1	
4		18	PB0_ADC0	
5		45	GPIO2_PB8	
6		29	GPIO1_PA8	
7		12	GPIO0_PA2	
8/10/12/14			GND	
9/11			NC	
13			VCC-3.3V	
15		25	SPI_NSS	
16		26	SPI_SCK	
17		27	SPI_MISO	
18		28	SPI_MOSI	
19		30	UART1_TXD	
20		31	UART1_RXD	
21		32	UART1_CTS	
22		33	UART1_RTS	
23		34	PA13_SWDIO	STM32-SWD 下载调试端口 /Download and debug port
24		37	PA14_SWCLK	

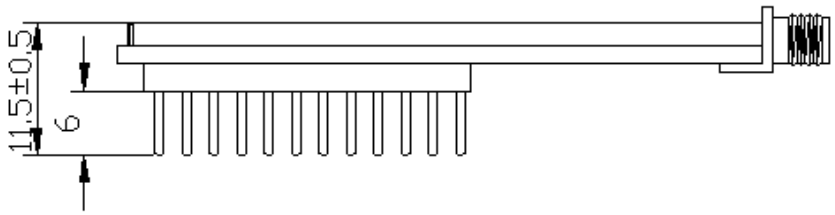
(1)插片式模块/ The plug-in module

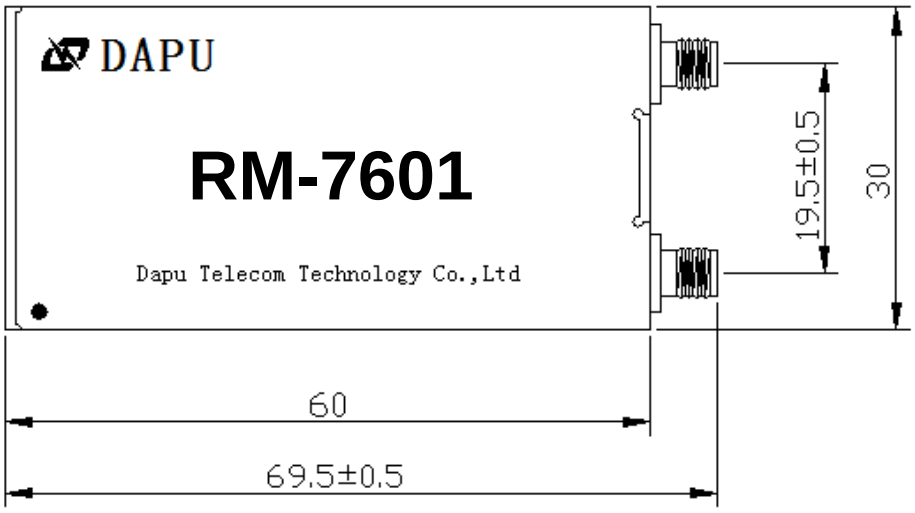


管脚功能说明

管脚	功能
1	I2C1 SCL
2	I2C1 SDA
3	PB1 ADC1
4	PB0 ADC0
5	GPIO2 PB8
6	GPIO1 PA8
7	GPIO0 PA2
8 10 12 14	GND
9 11	NC
13	VCC-3.3V
15	SPI NSS
16	SPI SCK
17	SPI MISO
18	SPI MOSI
19	UART1 TXD
20	UART1 RXD
21	UART1 CTS
22	UART1 RTS
23	PA13 SWDIO
24	PA14 SWCLK

未标注公差为±0.2mm



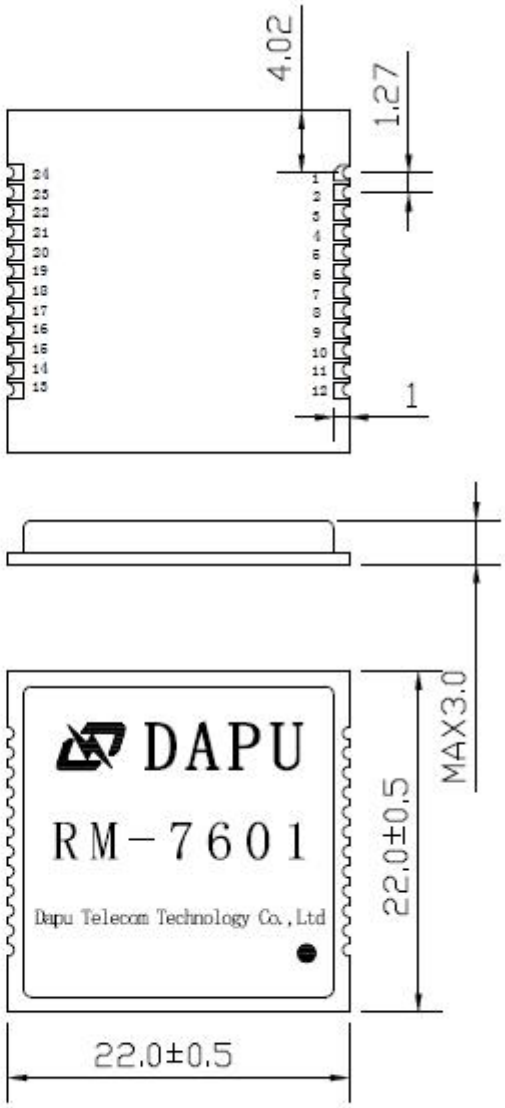


(2)贴片式模块/ The SMT module

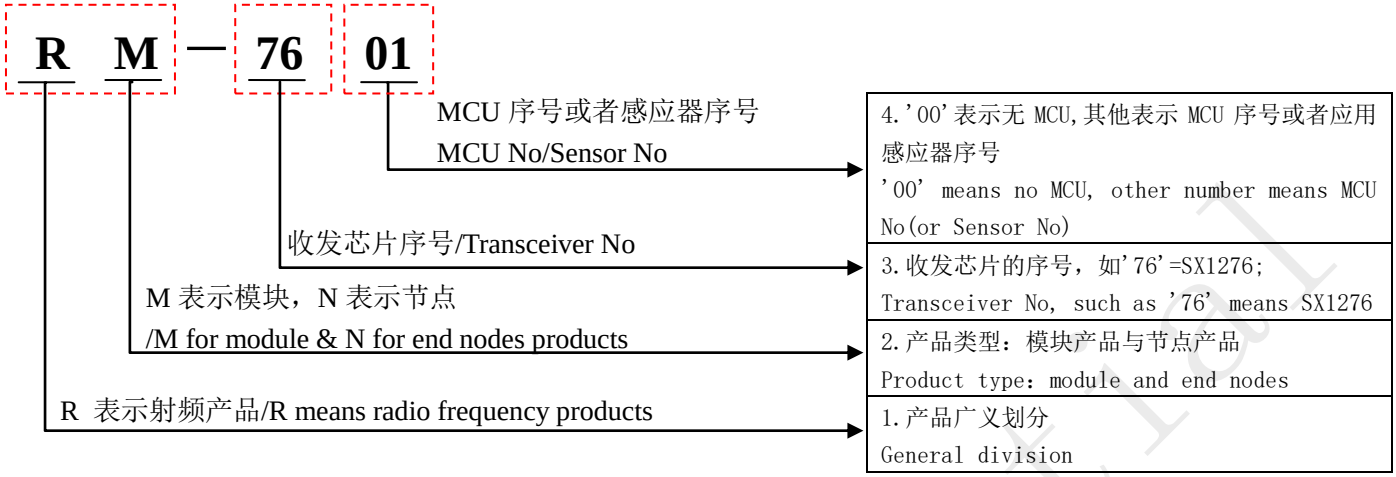
管脚功能说明

管脚	功能
1	I2C1 SCL
2	I2C1 SDA
3	PB1 ADC1
4	PB0 ADC0
5	GPIO2 PB8
6	GPIO1 PA8
7	GPIO0 PA2
8	GND
9	ANT-LF
10	GND
11	ANT-HF
12	GND
13	VCC-3.3V
15	SPI NSS
16	SPI SCK
17	SPI MISO
18	SPI MOSI
19	UART1 TXD
20	UART1 RXD
21	UART1 CTS
22	UART1 RTS
23	PA13 SWDIO
24	PA14 SWCLK

未标注公差为±0.2mm



4. 产品型号说明/ Product model description:



5. 抽样测试结果表/ Sample test results table

发射测试/TX Test									接收测试/RX Test		
工作频点 /Frequency	发射功率设置 /Setting	实测发射功率 /Transmit Power	实测发射电流 /Transmit Current	扩频实测/Spread Frequency MHz					接收灵敏度 /Sens.	扩频因子 /SF	接收工作电流 /cur.
				868	1302	1736	2170	2604			
434MHz	17 dBm	16.13 dBm	82 mA	-57.3	-58	-73	-73	-73	-139dBm	SF=12	12mA
	20 dBm	18.31 dBm	106 mA	-57	-57.4	-74	-73	-73			
470MHz				940	1410	1880	2350	2820			
	17 dBm	15.94 dBm	80 mA	-50	-62	-70	-73	-73	-139dBm	SF=12	12mA
	20 dBm	18 dBm	103 mA	-50	59	-74	-73	-73			
868MHz				1736	2604	3472	4340	5208			
	15 dBm	14.25 dBm	37 mA	-35	-45	-34.5	-65	-70	-137dBm	SF=12	11mA
915MHz				1830	2745	3660	4575	5490			
	15 dBm	14.17 dBm	38 mA	-33	-52	-38	-70	-70	-137dBm	SF=12	12mA
待机/standby current			2mA			频率误差/Frq error			+4KHz		