

客户宝号: \_\_\_\_\_  
Travelling Merchant

# DATASHEET

品名规格: **RM-7801P**  
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:2015.12.21 Date:			

## 广东大普通信技术有限公司

东莞市松山湖科技产业园区北部工业城 16 栋

Guangdong Dapu Telecom Technology Co.,Ltd

Bldg16,.N.Ind.Zone,SSL Industry Park, Dongguan City, Guangdong Province, China

TEL: 0086-0769-88010888 FAX: 0086-0769-81800098

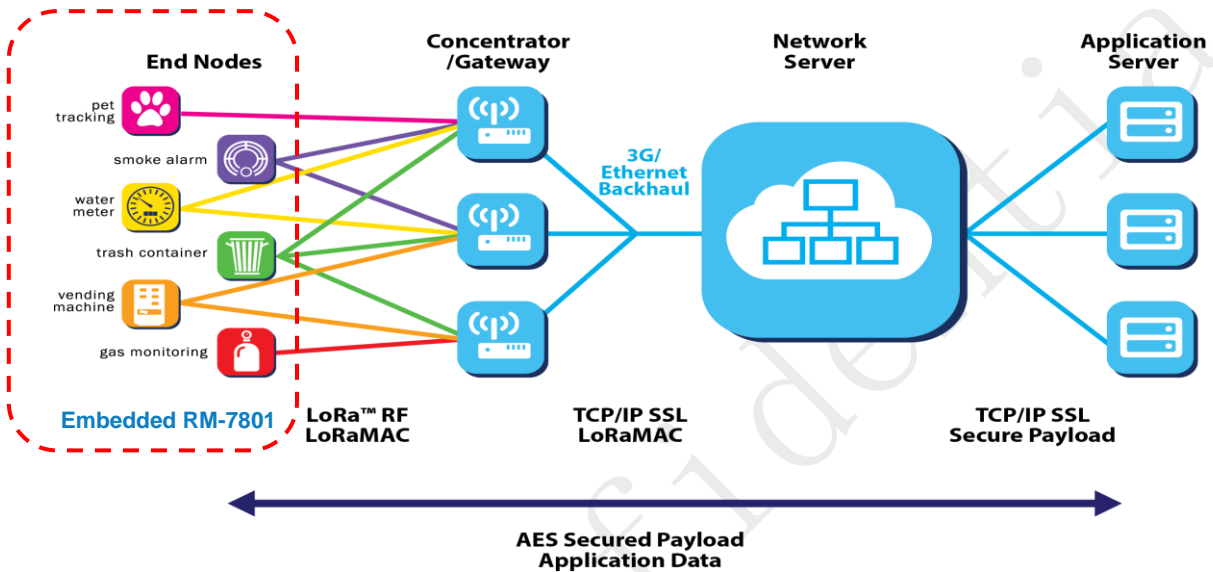


# RM-7801P

Long Range & Low Power

434/470MHz

LoRa™ Module



## INTRODUCTION

The RM-7801 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-7801 is LoRaWAN™ 1.0 compliant. By using sub-GHz ISM bands, the RM-7801 providing bi-directional data communication up to 15 km line-of-sight and over 2 km into harsh environment.

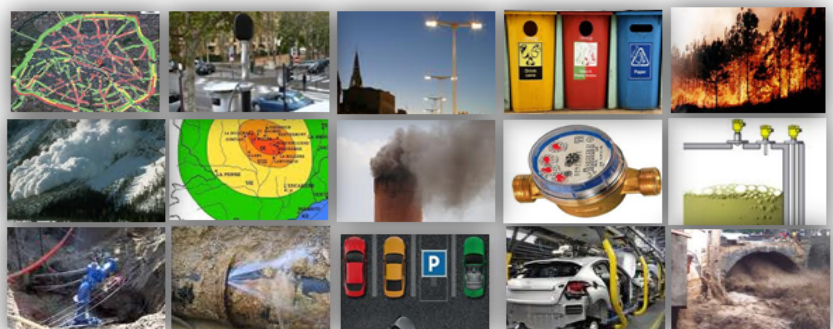
The secure transmission with security protocols such as 'Packet engine up to 256 bytes with CRC', the long battery by fitting with ultra low power consumption transceiver and MCU, the easier connectivity with superior transmit power and receive sensitivity.

## 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-7801P					
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	°C	
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	SX1278				
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	137~525	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 RF output	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

RF 板/Board	相连引脚号/ Connected pin No.		引脚定义/Pin definition	说明/Description
	SX1278	STM32L151C8U6		
	7	21	RF_NRESET	Reset trigger input
	8	22	RF_DIO0	Digital I/O
	9	2	RF_DIO1	Digital I/O
	10	46	RF_DIO2	Digital I/O
	11	40	RF_DIO3	Digital I/O
	12	39	RF_DIO4	Digital I/O
	13	38	RF_DIO5	Digital I/O
	16	15	RF_SCK	SPI Clock input
	17	16	RF_MISO	SPI Data output
	18	17	RF_MOSI	SPI Data input
	19	14	RF_NSS	SPI Chip select input
	20	13	RF_RXTX	Rx/Tx switch :high in Tx
		11	RF_FEM_CPS	射频收发开关/ Tx&Rx Switch, High in Tx
1			NC	
2		37	SWCLK	STM32-SWD 下载调试端口 /Download and debug port
3		34	SWDIO	
4		42	SCL	I2C1_SCL
5		43	SDA	I2C1_SDA
6		19	ADC1	PB1_ADC1
7		18	ADC0	PB0_ADC0
8		45	PB8	GPIO2_PB8
9		29	PA8	GPIO1_PA8
10		12	PA2	GPIO0_PA2
11			NC	NC
12			ANT_L	ANT_LF
13		1/9/24/36/48	VDD	VDD-3.3V
14		0/8/20/23/35/47	GND	GND
15		25	NSS	SPI_NSS
16		26	SCK	SPI_SCK
17		27	MISO	SPI_MISO
18		28	MOSI	SPI_MOSI
19		30	TXD	UARTI_TXD
20		31	RXD	UARTI_RXD
21		32	CTS	UARTI_CTS
22		33	RTS	UARTI_RTS

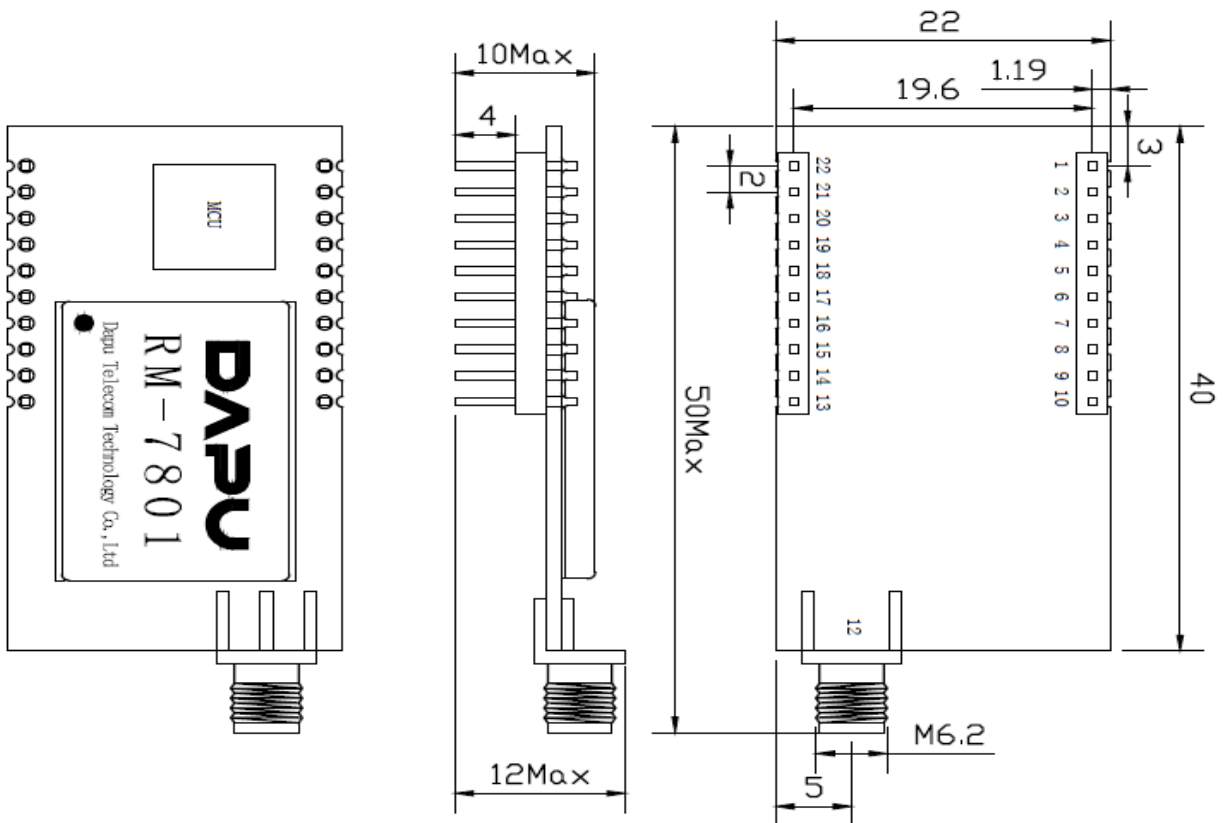


引脚示意图/ PIN Diagram

Number	Name
1	NC
2	SWCLK
3	SWDIO
4	SCL
5	SDA
6	ADC1
7	ADCO
8	PB8
9	PA8
10	PA2
12	ANT_LF
13	VDD
14	GND
15	NSS
16	SCK
17	MISO
18	MOSI
19	TXD
20	RXD
21	CTS
22	RTS

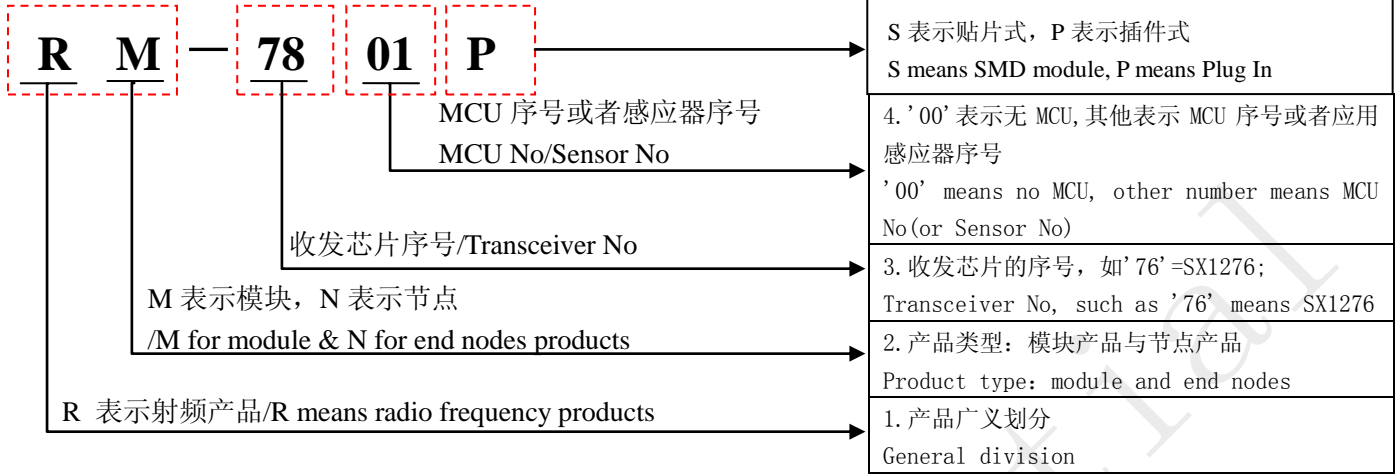
Pin Description

Not marked tolerance :  $\pm 0.2\text{mm}$





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	-139dBm	SF=12	12mA
	17 dBm	15.94 dBm	80 mA	-50	-62	-70	-73	-73			
	20 dBm	18 dBm	103 mA	-50	59	-74	-73	-73			
待机/standby current			2mA		频率误差/Frq error				+4KHz		