



成都亿佰特电子科技有限公司
 Chengdu Ebyte Electronic Technology Co.,Ltd.

E19-868MS100 Datasheet v1.0

1. Introduction

E19-868MS100



E19-868MS100 is based on original imported RFIC SX1276 from SEMTECH, adopts LoRa spread spectrum technology. Which means the transmitting distance is much longer than before, besides the power density is more concentrated and anti-interference performance is better.

E19-868MS100 is a hardware platform without program, users need to carry on a second development.

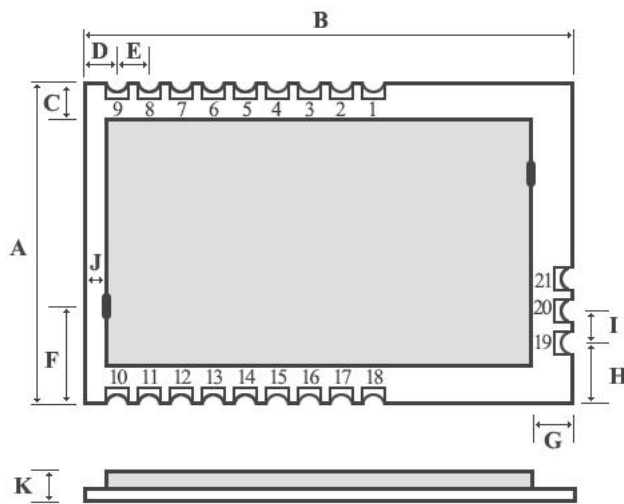
2. Electrical parameter

E19-868MS100

No.	Parameter item	Parameter details	Parameter details
1	RF IC	SX1276	SEMTECH
2	Size	17.6* 25.2mm	
3	Weight	1.6g	
4	Frequency Band	862~893MHz	Adjustable by configuration software. 32MHz crystal oscillator.
5	PCB	4-layer	Impedance-matching, lead-free
6	Connector	2 * 9 * 1.27mm	SMD
7	Supply voltage	1.8 ~ 3.6V DC	The voltage higher than 3.6V is forbidden
8	Communication level	0.7VCC ~ 3.6VDC	VCC refers to the supply voltage
9	Operation Range	5000m	Clear and open area, 20dBm , antenna gain: 5dBi , height: 12m , Air data rate: 300bps, Coding rate 4/5 , spread factor 12
10	Transmitting power	Maximum 20dbm	About 100mW
11	Air data rate	0.018k ~ 37.5kbps	LoRa Mode,find on SX1276 datasheet.
12	Sleep current	1uA(Max)	Sleep mode
13	Transmitting current	110mA@20dBm	The proposed power supply capacity is greater than 250mA.
14	Receiving current	13.8mA BW = 500KHz	LoRa Mode, the receiving current is different with different BW.
15	Communication interface	SPI	Data rate: up to 10Mbps
16	Transmitting length	256 bytes	FIFO
17	Receiving length	256 bytes	FIFO
18	RSSI support	Available	Please find more on SX1276 datasheet.
19	Antenna type	Stamp hole	50Ω characteristic impedance
20	Operating temperature	-40 ~ +85°C	Industrial-grade
21	Operating humidity	10% ~ 90%	Relative humidity, without condensation
22	Storage temperature	-40 ~ +125°C,	Industrial-grade
23	Sensitivity	-138dBm@300bps	LoRa Mode , find on SX1276 datasheet.

3. Pin definition

E19-868MS100



Units: mm

	MIN	MAX
A	17.6	18.0
B	25.0	25.5
C	1.3	1.5
D	2.0	2.2
E	1.27	1.27
F	4.0	4.5
G	1.2	1.5
H	3.30	3.40
I	1.27	1.27
J	0.9	1.0
K	3.5	4.0

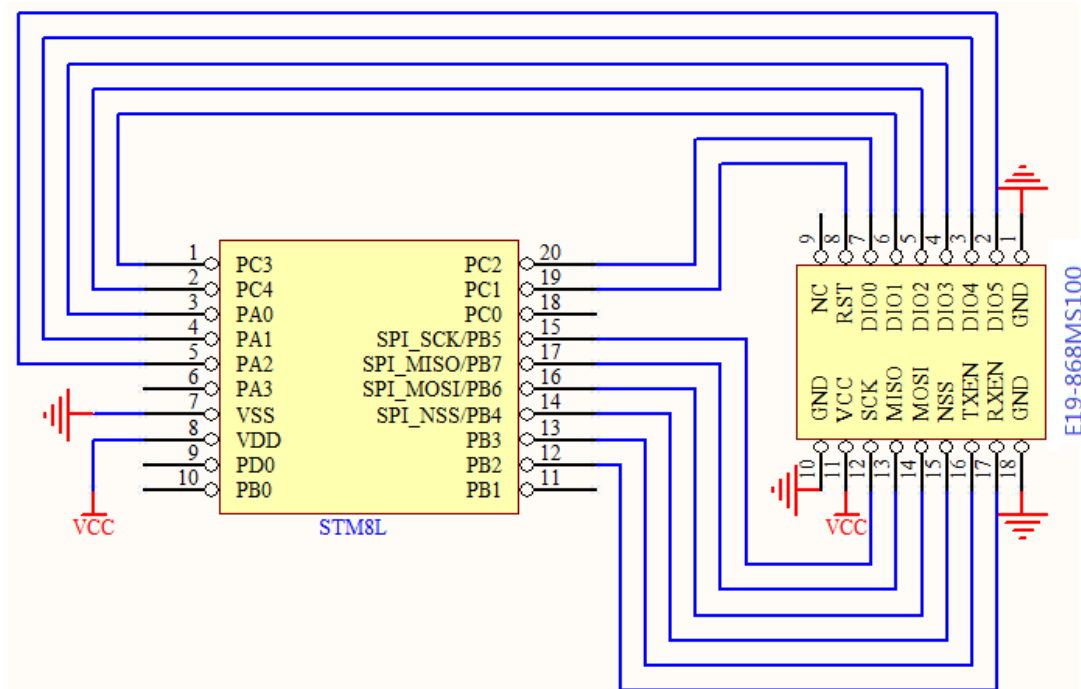
Pin No.	Pin item	Pin direction	Pin application
1	GND		Ground
2	DIO5	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
3	DIO4	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
4	DIO3	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
5	DIO2	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
6	DIO1	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
7	DIO0	Input/Output	Configurable IO port(Please find more on SX1276 datasheet).
8	RST	Input	Reset
9	NC		Not connect.
10	GND		Ground
11	VCC		Power supply 1.8V~3.6V DC. 3.3V and external ceramic filter capacitor are recommended.
12	SCK	Input	SPI clock
13	MISO	Output	Master input slave output
14	MOSI	Input	Master output slave input
15	NSS	Input	Chip select
16	TXEN	Input	Radio frequency switch control, make sure the TXEN pin is in high level, RXEN pin is in low level when transmitting.
17	RXEN	Input	Radio frequency switch control, Make sure the RXEN pin is in high level ,TXEN pin is in low level when receiving.
18	GND		Ground
19	GND		Ground
20	ANT		Ground
21	GND		Ground

★ Please find more on SX1276 datasheet from SEMTECH ★

4. Notes **E19-868MS100**

No.	Item	Attention
1	Static electricity	Please try not to touch the electronic components with bare hands.
2	Welding	When welding, soldering iron needs grounding. The producer needs to wear cable electrostatic bracelet which is grounding when mass production.
3	Power supply	Power quality has a great impact on the performance of the module, please make sure the power supply has small ripple and avoid the frequent and large jitter. π filter is recommended(Ceramic capacitor // tantalum capacitor + inductance).
4	Ground	Single-point grounding is recommended. 0 ohm resistor or 10mH inductance are recommended.
5	Antenna	How to install antenna has a great impact on the performance of the module, please make sure the antenna is exposed and vertical upward. It will lead to the transmitting distance greatly weakened if the antenna installs in the interior of housing. When the module is installed in the interior of the housing, high-quality antenna extension line can be used to extend the antenna to the outside of the housing.
6	Interference	If there are different modules work in other frequency band in the same product, the user need to plan rationally and take measures to shield, in case the harmonic interference and intermodulation interference exist.
7	Crystal oscillator	Please increase the liner distance between the crystal oscillators as possible, if there are crystal oscillators in the module near the PCB.

5. Usage **E19-868MS100**



No.	Brief introduction of connection between module and MCU (STM8L)
1	DIO0、DIO1、DIO2、DIO3、DIO4、DIO5 are general I/O port, can be configured into multiple functions. Please check SX1278 datasheet for more details. Floating is allowed.
2	RST, TXEN, RXEN pin must be connected, in which RST control the reset of chip, TXEN, RXEN pin control RF switch.
3	Make sure the grounding is ok, with low power supply ripple, also should increase filter capacitor and as close as possible to VCC and GND pin.

6. Software programming E19-868MS100

No.	Note
1	SPI communication rate should not be set too high, usually around 1Mbps.
2	Make sure the TXEN pin is in high level, RXEN pin is in low level when transmitting; Make sure the RXEN pin is in high level ,TXEN pin is in low level when receiving; Make sure the TXEN、RXEN is in low level before power-down
3	The register configuration can be reinitialized to obtain higher stability when the chip is invalid

7. Series of products E19-868MS100

Model	IC	Frequency Hz	Power dBm	Distance km	Package	ANT
E19-433MS100	SX1278	433M	20	5.0	SMD	Stamp hole
E19-433MS1W	SX1278	433M	30	10.0	SMD	Stamp hole
E19-915MS100	SX1276	915M	20	5.0	SMD	Stamp hole
E19-868MS100	SX1276	868M	20	5.0	SMD	Stamp hole

8. FAQ E19-868MS100

★ Operation Range is too short to reach the ideal distance		
1	Barrier	It has deep influence on the operation range when there are barriers. The degree of attenuation is inconsistent in different environment.
2	Interference resource	Temperature、humidity ,same frequency interference can increase the packet loss rate of the communication.
3	Metal	Metal objects around the antenna, or antenna placed inside metal case, will lead to the signal attenuation badly.
4	Parameter values	Wrong parameter setting. Setting the air data rate too high, which lead to the shorter distance.
5	Low voltage	When the voltage below 3.3V, the lower the voltage is, the lower the transmitting power can be.

9. About us

E19-868MS100



Chengdu Ebyte Electronic Technology Co., Ltd is a high-tech company, focus on wireless transmission. Our company owns a number of independent research & development products and obtain unanimously approved customers. With powerful R&D team, our company can provide customers with perfect After-sales service and technical assistance.



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