



E10-433MD-SMA Datasheet V1.0

1. Introduction

E10-433MD-SMA



E10-433MD-SMA is a 100mW RF wireless transceiver module, operates at 433MHz. SPI interface, gold-plated SMA interface for external antenna, with 26M crystal oscillator and stable batch production, which makes the module is suitable for various applications (especially for smart lock).

E10-433MD-SMA is based on original imported RF SI4463 from Silicon Labs in USA. Module features stable performance, long transmitting distance and strong penetration and diffraction ability. With high receiving sensitivity, good anti-interference ability and low-power development, E10-433MD-SMA is widely

used in various industries nowadays.

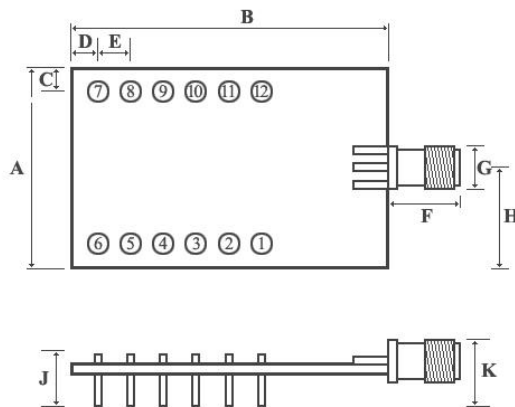
2. Electrical parameter

E10-433MD-SMA

No.	Parameter item	Parameter details	Description
1	RF IC	SI4463	Silicon Labs
2	Size	16.6 * 24mm	Without antenna & SMA
3	Production process	Machine	Lead-free
4	Connector	2 * 6 * 2.54mm	Plug-in
5	Supply voltage	1.8 ~ 3.6V DC	Notes: the voltage higher than 3.6V is forbidden
6	Frequency Band	425~525MHz	Adjustable, 26M crystal oscillator
7	Communication level	0.7VCC ~ 3.6V DC	VCC refers to the supply voltage
8	Operation Range	About 2000m	Test condition: Clear and open area, 20dBm ,antenna gain: 5dBi , height: 2m , Air date rate: 1kbps
9	Transmitting power	Maximum 20dbm	About 100mW
10	Air data rate	0.123kbps - 1Mbps	Low speed is recommended
11	Sleep current	0.6uA	
12	Transmitting current	81mA@20dBm	The largest emission current
13	Receiving current	13mA	Receives an average current
14	Communication interface	SPI	Data rate: up to 10Mbps
15	Transmitting length	1~64 bytes	For one package
16	Receiving length	1~64 bytes	For one package
17	RSSI support	Usable	
18	Antenna type	SMA-K	50 ohm characteristic impedance
19	Sensitivity	-126dBm	1kbps
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

3. Pin definition

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Units: mm

	MIN	MAX
A	16.6	16.7
B	24.0	24.1
C	1.48	1.52
D	2.38	2.42
E	2.54	2.54
F	9.60	9.60
G	6.20	6.20
H	8.30	8.35
J	11.2	11.3
K	12.8	12.9

Pin No.	Pin item	Pin direction	Pin application
1	GND		Ground
2	SDN		The module working enable control the pin, its low level when working (See SI4463 manual for more details)
3	GPIO3	Output	Connect to the transmitter of the internal module RF switch ,also cannot be connected, intelligent controlled by SI4463
4	GPIO2	Output	Connect to the receiving of the internal module RF switch also cannot be connected, intelligent controlled by SI4463
5	nSEL	Input	SPI Chip select
6	MOSI	Input	SPI master output slave input
7	MISO	Output	SPI master input slave output
8	SCK	Output	SPI Chip select
9	IRQ	Output	Interrupt request
10	GPIO1	Output	Output pin
11	GPIO0	Output	Output pin
12	VCC		Power supply 1.8V ~ 3.6V DC

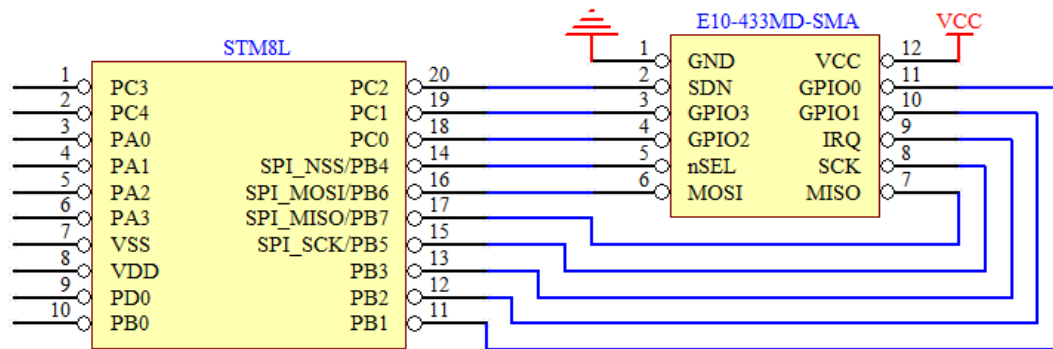
4. Note

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No.	Item	Attention
1	Static electricity	Please try not to touch the electronic components with bare hands.
2	Ground	Single-point grounding is recommended. 0 ohm resistor or 10mH inductance are recommended.
3	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.
4	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.

5. USAGE

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No.	Brief introduction of connection between module and MCU (STM8)
1	GPIO0\GPIO1\GPIO2\GPIO3 is general purpose I/O, can be configured into multiple functions, please check SI4463 manual for more details.
2	It is possible to get the interrupt status through SPI, floating is allowed. It is recommended to use GDO2 to Connect the MCU as external interrupt
3	Make sure the grounding is good, with low power supply ripple, also should increase filter capacitor and as close as possible to VCC and GND pin

6. Software programming

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No.	Note
1	SPI communication rate should not be set too high, usually around 1Mbps.
2	Please refer to the part of "Operating Modes and timing" for SI4463's state transition, the state transitions of TX and RX have to pass "Ready", it cannot switch directly
3	The register configuration can be reinitialized to obtain higher stability when the chip is in valid

7. Series of products

E10-433MD-SMA

Model	RF IC	Package	Power	Range	Antenna Type
E10-433MD-SMA	SI4463	Plug-in	20dBm	2000m	SMA-K
E10-433MD-TH	SI4463	Plug-in	20dBm	1800m	Spring
E10-433MS	SI4463	SMD	20dBm	1500m	N/A
E10-433MD3	SI4438	SMD	20dBm	1900m	IPEX
E10-915MS	SI4463	SMD	20dBm	1800m	N/A

8. FAQ**E10-433MD-SMA****★ 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, antenna placed inside metal case, which cause 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**E10-433MD-SMA**

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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