# 1 Feature Description

## 1.1 Introduction

FD-MC1406 is a satellite navigation four-element (4-channel) anti-jamming antenna with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband, and maximum interference resistance 3. The FD-MC1406 is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle -mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1406 uses multiple element spatial frequency adaptive filtering (SFAP). The FD-MC1406 quad-element anti-jamming antenna operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| four-element anti-jam mode | FD-MC1406-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1406-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 | Single interference≥105dBc ,three interference≥95dBc |

# 2 Interface Definition

## 2.1 RF Interface

1) Anti-interference signal output interface is SMA Female.
2) Output RF signal power: -63±5 dBm.
3) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1406 data interface connector uses the J30J-9ZKP. The interface is defined as follows: software can be upgraded via serial port , and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 5.0V |
| 3/4 | GND | GND |
| 8 | RS232_TXD | Output |
| 9 | RS232_RXD | Input |
| 5、6、7 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 4.5 | 5 | 5.5 | V | default 5V |
| Power consumption | | 7.5 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1406 measures 65mm×65mm×19.4mm with a tolerance of±0.2mm, and the dimensions are shown in Figure .

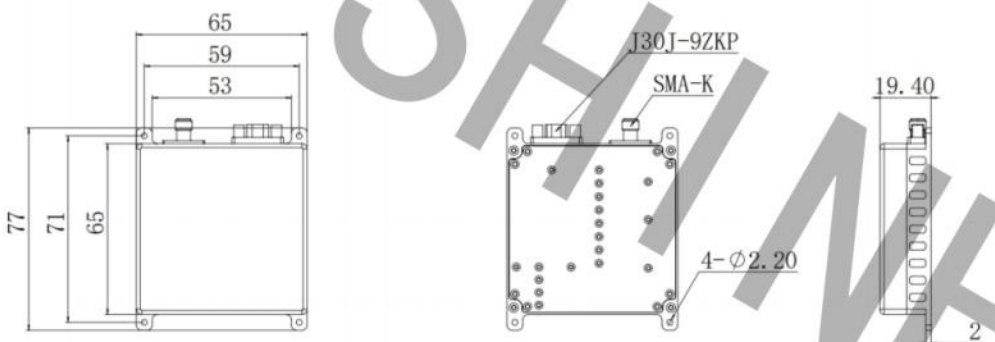



Figure Dimensions Diagram of FD-MC1406

## 3.5 Weight

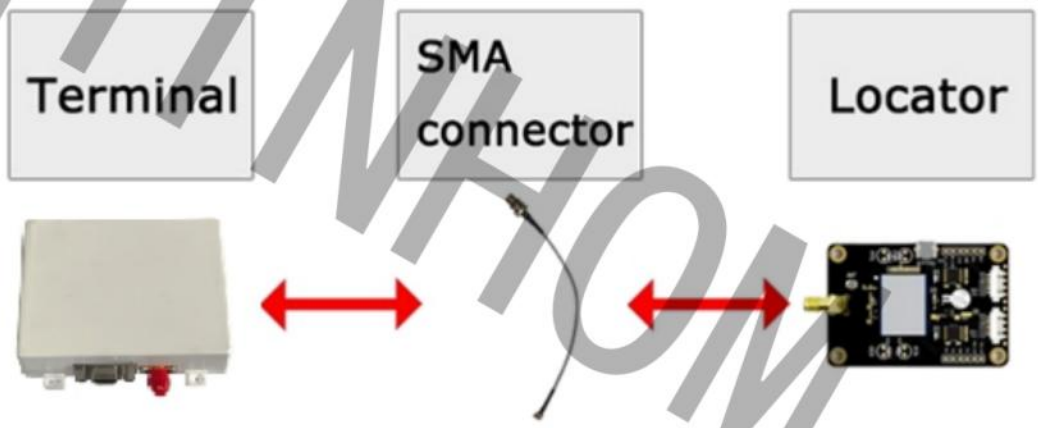
The FD-MC1406 weighs no more than 140g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety
2) Convoy defense and navigation security
3) High-end logistics and navigation security

# 5 Connection relationship description

This product replaces the conventional active antenna. When using the RF interface of the product, ensure that the interface of the access party does not provide power to the product to avoid possible power conflicts or damage. The following schematic diagram.



# 1 Feature Description

## 1.1 Introduction

FD-MC1406D is a miniaturized four-element anti-jamming receiver for satellite navigation with fully independent intellectual property rights.It measures only 65 mm × 65 mm × 24.2 mm and supports four-element wideband anti-jamming for the B1/L1 band.The maximum number of suppressible wideband interferences is 3. The FD-MC1406D adopts a wide input voltage design and a fully shielded structureand.It is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1406D uses multiple element spatial frequency adaptive filtering (SFAP).
The FD-MC1406D four-element anti-jamming receiver operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| four-element anti-jam mode | FD-MC1406D-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1406D-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 | Single interference≥105dBc ,three interference≥95dBc |

## 1.4 Accuracy Specifications and Timing Characteristics

| Option | Specifications |
|---|---|
| Signal Frequency | GPS L1 ; BEIDOU B1 |
| Positioning Accuracy | Jamming free positioning accuracy: horizontal: 6m, elevation: 8m<br>Jamming positioning accuracy: horizontal: 10m, elevation: 10m |
| Output protocols | NMEA0183, unicore, DroneCAN， etc |

| | |
|---|---|
| **Cold start time** | ≤40S |
| **Warm start time** | ≤8S |
| **Input voltage** | 9V~36V, default 12V |

# 2 Interface Definition

## 2.1 RF Interface

1) Output RF signal power: -63±5 dBm.

2) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1406D data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port , and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 5 | UART_TX | Receiver Serial Port Output |
| 6 | UART_RX | Receiver Serial Port Input |
| 7 | UART_GND | UART_GND |
| 8 | RS232_TXD | Anti-Jamming Serial Port Output |
| 9 | RS232_RXD | Anti-Jamming Serial Port Input |
| 10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |

| | | | | | |
|---|---|---|---|---|---|
| Power consumption | | 8.5 | | W | |
| **Notes** | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| **Parameters** | **Minimum** | **Maximum** | **Units** |
|---|---|---|---|
| | **value** | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1406D measures 65mm×65mm×24.2mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

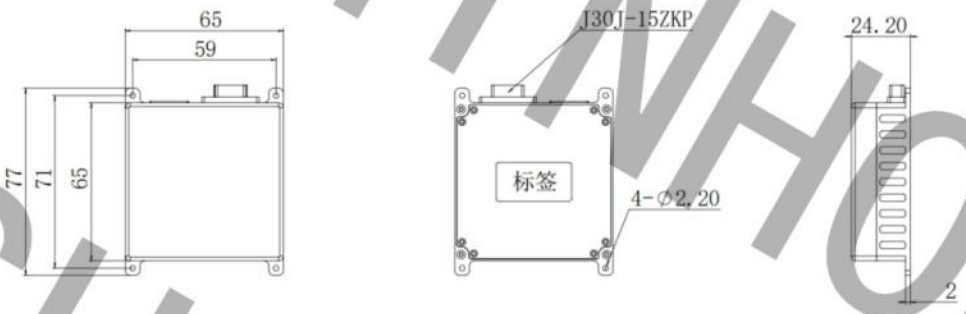



Figure 1 Dimensions Diagram of FD-MC1406D

## 3.5 Weight

The FD-MC1406D weighs no more than 150g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 1 Feature Description

## 1.1 Introduction

FD-MC1406E is a satellite navigation four-element (4-channel) anti-interference receiver, It supports BEIDOU B1/GPS L1 signal reception, It can simultaneously suppress various wideband narrowband, and maximum interference resistance 3. Meanwhile, FD-MC1406E incorporates a magnetic compass. The FD-MC1406E is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Key Indicators

anti-interference capability

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1406E | GPS L1 ; BEIDOU B1; GALILEO E1 | Single interference≥105dBc ,three interference≥95dBc |

indicators characteristics:

| Category | Indicator |
|---|---|
| Signal frequency | GPS L1 ： 1575.42MHz±1.023MHz<br>BEIDOU B1： 1561.098MHz±2.046MHz<br>GALILEO E1 |
| Positioning accuracy: | Non-interference : Horizontal: 6m(95%), Vertical: 8m(95%)<br>With interference: horizontal: 10m(95%), vertical: 10m(95%) |
| Speed accuracy | 0.2 m / second (95%) |
| Output protocol: | DroneCAN/ NMEA0183 |
| Cold start time | ≤ 40 second |
| Hot start time | ≤ 15 second |
| Operating voltage: | 5V±0.5V |
| Anti-burning function | The continuous power is not less than 10W |

| | |
|---|---|
| Interference detection | With the interference detection function |
| Magnetic compass heading accuracy | 1° |

# 2 Interface Definition

## 2.1 Data interface

The FD-MC1406E data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port/ can bus , and interference status information can also be output. It can be directly connected to the flight control system via the CAN bus.

| Pin number | Definitions | direction | Notes |
|---|---|---|---|
| 1/2 | VCC | import | Power input: 5.0V |
| 3/4 | GND | import | GND |
| 5 | CAN_H | | connected to the flight control system |
| 6 | CAN_L | | |
| 7 | CAN_GND | | |
| 8 | RS232_TXD | output | Anti-interference serial port, Anti-interference state information output |
| 9 | RS232_RXD | import | Anti-interference serial port, Anti-interference status inquiry |
| 10~15 | Retain | | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 4.5 | 5 | 5.5 | V | default 5V |
| Power consumption | | 9 | | W | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1406E measures 65mm×65mm×31.8mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 2.

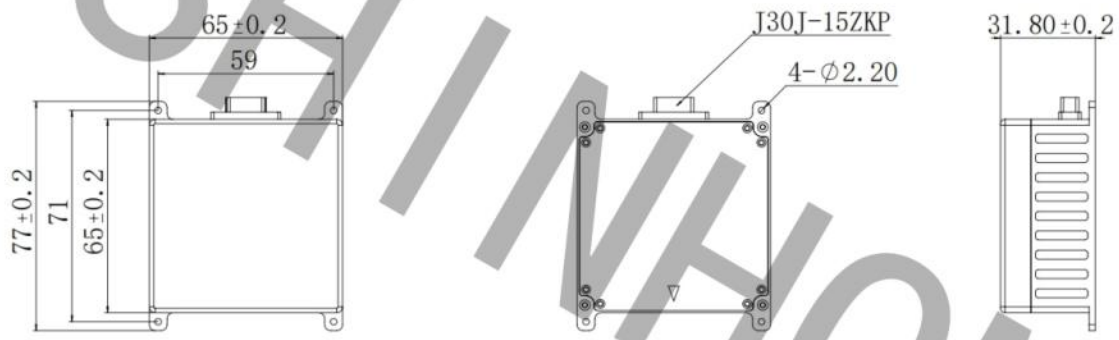



Figure 2 Dimensions Diagram of FD-MC1406E

## 3.5 Weight

The FD-MC1406E weighs no more than 200g

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 5 Installation and use

## 5.1 fixed

Install fixation with M2 screws.

Attention： When installing, make sure the arrow points towards the drone's head direction

## 5.2 supply electricity

power supply voltage 4.5-5.5V, maximum not exceeding 5.5V, recommended to use 5V

## 5.3 Docking with the flight control

This product is connected to the flight controller via a CAN bus, using the Drone CAN protocol

# 1 Feature Description

## 1.1 Introduction

FD-MC1410 is a satellite navigation four-element (4-channel) anti-jamming antenna with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband, and maximum interference resistance 3. The FD-MC1410 is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1410 uses multiple element spatial frequency adaptive filtering (SFAP). The FD-MC1410 quad-element anti-jamming antenna operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| four-element anti-jam mode | FD-MC1410-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 |
| | FD-MC1410-4B3 | BEIDOU B3 |
| | FD-MC1410-4L2 | GPS L2 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1410-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 | Single interference≥110dBc ,three interference≥100dBc |
| FD-MC1410-4B3 | BEIDOU B3 | Single interference≥110dBc ,three interference≥100dBc |
| FD-MC1410-4L2 | GPS L2 | Single interference≥110dBc ,three interference≥100dBc |

# 2 Interface Definition

## 2.1 RF Interface

1) Anti-interference signal output interface is SMA Female.

2) Output RF signal power: -63±5 dBm.

3) Output impedance 50 ohms

## 2.2 Data interface

The FD-MC1410 data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 5.0V |
| 3/4 | GND | GND |
| 8 | RS232_TXD | Output |
| 9 | RS232_RXD | Input |
| 5~7、10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 4.5 | 5 | 5.5 | V | default 5V |
| Power consumption | | 7.0 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1410 measures 100mm×100mm×25mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure .

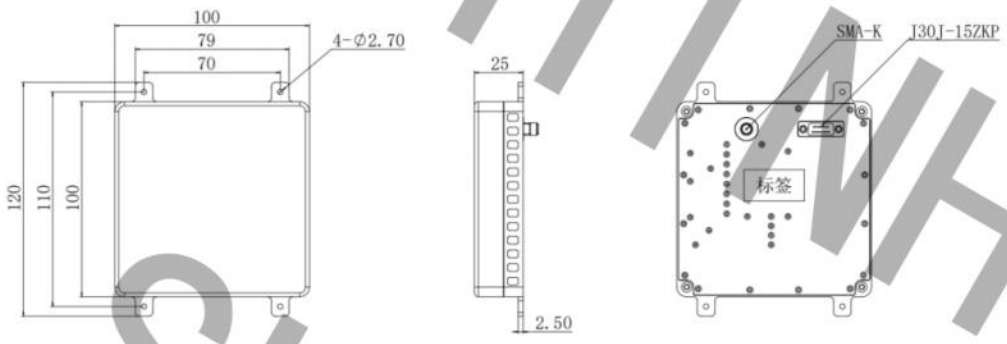



Figure Dimensions Diagram of FD-MC1410

## 3.5 Weight

The FD-MC1410 weighs no more than 300g.

# 4 Typical application occasions

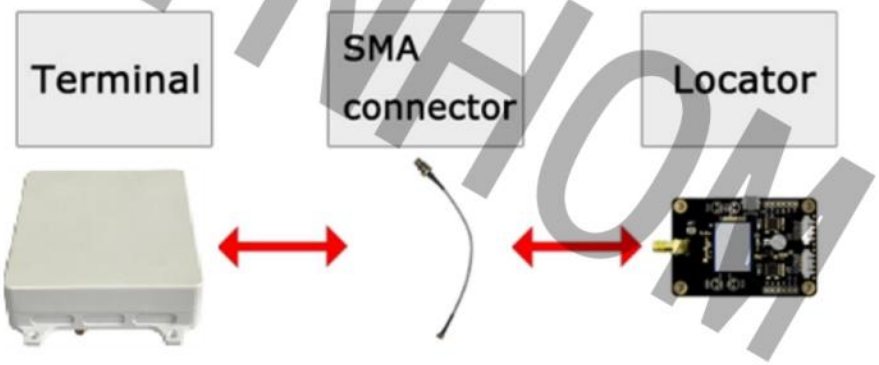
1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 5 Connection relationship description

This product replaces the conventional active antenna. When using the RF interface of the product, ensure that the interface of the access party does not provide power to the product to avoid possible power conflicts or damage. The following schematic diagram.



# 1 Feature Description

## 1.1 Introduction

FD-MC1410D is a satellite navigation four-element anti-jamming receiver with full independent intellectual property rights. It supports quad- array wideband anti- jamming for both B1L1 or B3 bands, with a maximum of 3 wideband interferences suppressed simultaneously for each band.The FD-MC1410D adopts a wide input voltage design and a fully shielded structureand.It is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1410D uses multiple element spatial frequency adaptive filtering (SFAP). The FD-MC1410D four-element anti-jamming receiver operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| four-element anti-jam mode | FDMC1410D-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 |
| | FDMC1410D-4B3 | BEIDOU B3 |
| | FDMC1410D-4L2 | GPS L2 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FDMC1410D-4L1B1E1 | GPS L1 ; BEIDOU B1; GALILEO E1 | Single interference≥110dBc ,three interference≥100dBc |
| FDMC1410D-4B3 | BEIDOU B3 | Single interference≥110dBc ,three interference≥100dBc |
| FDMC1410D-4L2 | GPS L2 | Single interference≥110dBc ,three interference≥100dBc |

## 1.4 Accuracy Specifications and Timing Characteristics

| Option | Specifications |
|---|---|
| Signal Frequency | BEIDOU B3 or GPS L1 ; BEIDOU B1 |
| Positioning Accuracy | Jamming free positioning accuracy: horizontal: 6m, elevation: 8m<br>Jamming positioning accuracy: horizontal: 10m, elevation: 10m |
| Output protocols | NMEA0183, unicore, DroneCAN，etc |
| Cold start time | ≤40S |
| Warm start time | ≤8S |
| Input voltage | 9V~36V, default 12V |

# 2 Interface Definition

## 2.1 RF Interface

1) Output RF signal power: -63±5 dBm.
2) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1410D data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port , and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 5 | UART_TX | Receiver Serial Port Output |
| 6 | UART_RX | Receiver Serial Port Input |
| 7 | UART_GND | UART_GND |
| 8 | RS232_TXD | Anti-Jamming Serial Port Output |
| 9 | RS232_RXD | Anti-Jamming Serial Port Input |
| 10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 10 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1410D measures 100mm×100mm×25mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

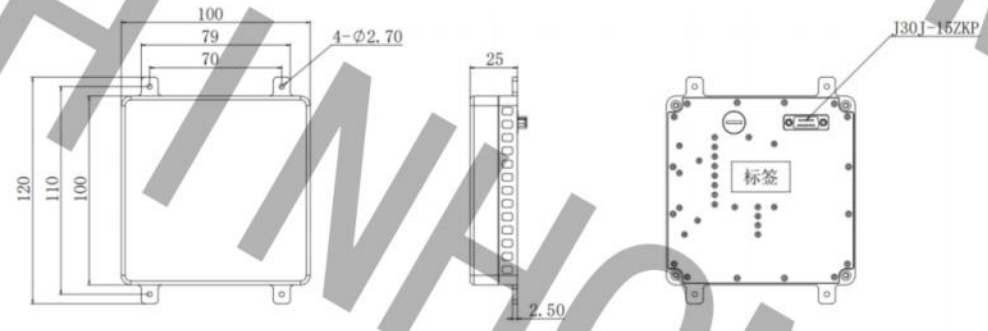



Figure 1 Dimensions Diagram of FD-MC1410D

## 3.5 Weight

The FD-MC1410D weighs no more than 320g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 1 Feature Description

## 1.1 Introduction

FD-MC1813 is a satellite navigation eight-element (8-channel) anti-jamming antenna with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband. It can support eight-array broadband anti-jamming for BDS-B3 or BDS-B1/GPS-L1.The FD-MC1813 is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1813 uses multiple element spatial frequency adaptive filtering (SFAP).

The FD-MC1813 eight-element anti-jamming antenna operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| B3 eight-element anti-jam mode | FD-MC1813-8B3 | BEIDOU B3 |
| L1B1 eight-element anti-jam mode | FD-MC1813-8L1B1 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1813-8L1B1 | GPS L1 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:** Single interference≥110dBc ,Seven interference≥85dBc |
| FD-MC1813-8B3 | BEIDOU B3 | **B3:** Single interference≥110dBc ,Seven interference≥85dBc |

# 2 Interface Definition

## 2.1 RF Interface

1) Anti-interference signal output interface is SMA Female.
2) Output RF signal power: -63±5 dBm.
3) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1813 data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 8 | RS232_TXD | Output |
| 9 | RS232_RXD | Input |
| 5~7、10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 15 | | W | |
| Notes | It has over voltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1813 measures 150mm×130mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

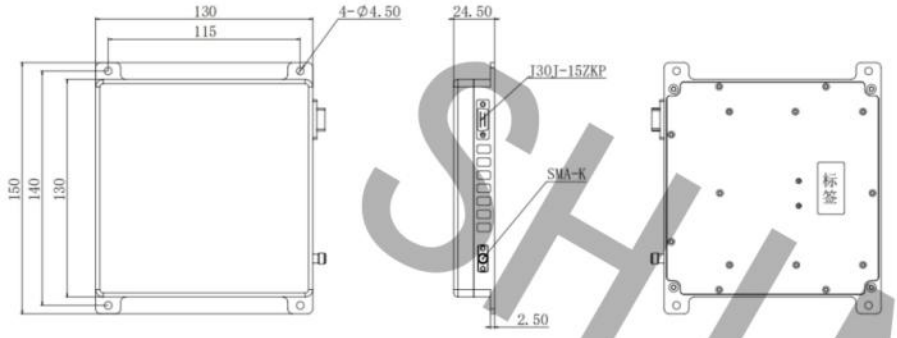



Figure 1 Dimensions Diagram of FD-MC1813

## 3.5 Weight

The FD-MC1813 weighs no more than 520g.

# 4 Typical application occasions

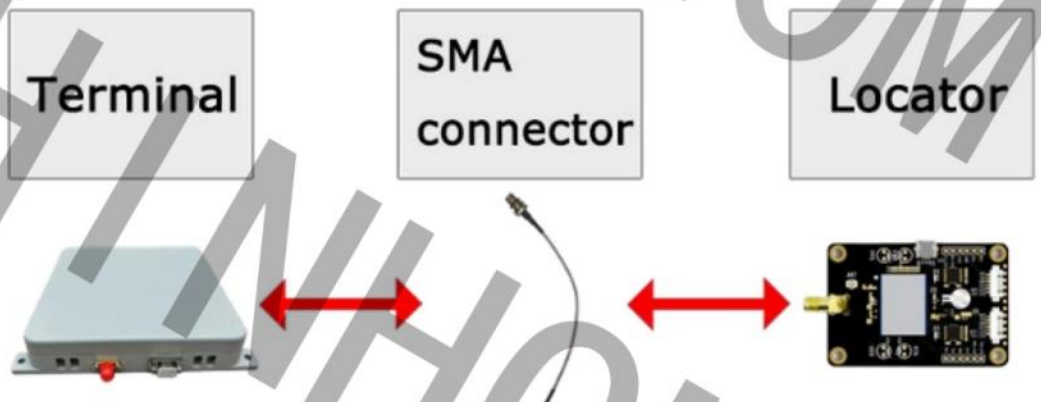
1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 5 Connection relationship description

This product replaces the conventional active antenna. When using the RF interface of the product, ensure that the interface of the access party does not provide power to the product to avoid possible power conflicts or damage. The following schematic diagram.



# 1 Feature Description

## 1.1 Introduction

FD-MC1813D is a satellite navigation eight-element (8-channel) anti-jamming receiver with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband. It can support eight-array broadband anti-jamming for BDS-B3 or BDS-B1/GPS-L1.The FD-MC1813D adopts a wide input voltage design and a fully shielded structureand.It is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1813D uses multiple element spatial frequency adaptive filtering (SFAP). The FD-MC1813D eight-element anti-jamming receiver operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| B3 eight-element anti-jam mode | FD-MC1813D-8B3 | BEIDOU B3 |
| L1B1 eight-element anti-jam mode | FD-MC1813D-8L1B1 | GPS L1、L2；BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1813D-8L1B1 | GPS L1 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:** Single interference≥110dBc ,Seven interference≥85dBc |
| FD-MC1813D-8B3 | BEIDOU B3 | **B3:** Single interference≥110dBc ,Seven interference≥85dBc |

## 1.4 Accuracy Specifications and Timing Characteristics

| Option | Specifications |
|---|---|
| Signal Frequency | BEIDOU B3 or GPS L1 ; BEIDOU B1 |
| Positioning Accuracy | Jamming free positioning accuracy: horizontal: 6m, elevation: 8m<br>Jamming positioning accuracy: horizontal: 10m, elevation: 10m |
| Output protocols | NMEA0183, unicore, DroneCAN，etc |
| Cold start time | ≤40S |
| Warm start time | ≤8S |
| Input voltage | 9V~36V, default 12V |

# 2 Interface Definition

## 2.1 RF Interface

1) Output RF signal power: -63±5 dBm.
2) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1813D data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 5 | UART_TX | Receiver Serial Port Output |
| 6 | UART_RX | Receiver Serial Port Input |
| 7 | UART_GND | UART_GND |
| 8 | RS232_TXD | Anti-Jamming Serial Port Output |
| 9 | RS232_RXD | Anti-Jamming Serial Port Input |
| 10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 17 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1813D measures 150mm×150mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

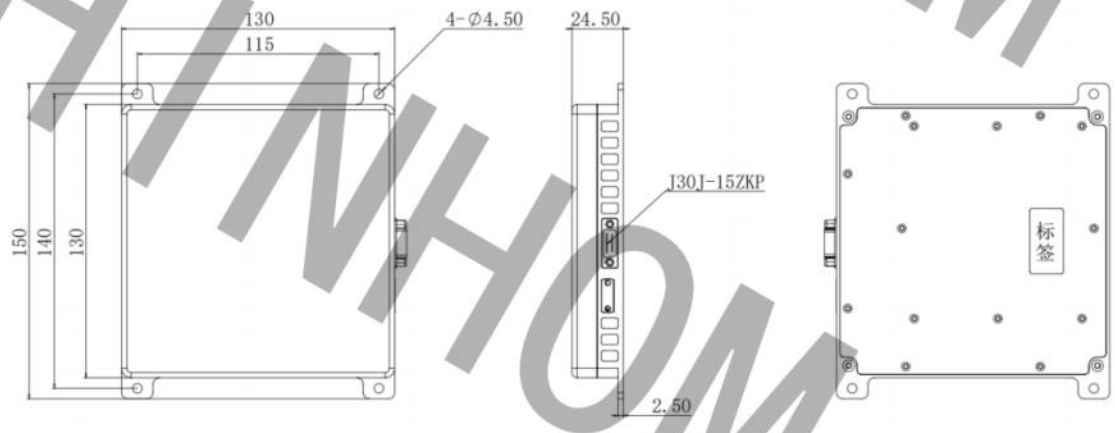



Figure 1 Dimensions Diagram of FD-MC1813D

## 3.5 Weight

The FD-MC1813D weighs no more than 540g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 1 Feature Description

## 1.1 Introduction

FD-MC1815 is a satellite navigation eight-element (8-channel) anti-jamming antenna with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband. It can support eight-array broadband anti-jamming for BDS-B3 or BDS-B1/GPS-L1.The FD-MC1815 is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1815 uses multiple element spatial frequency adaptive filtering (SFAP).
The FD-MC1815 eight-element anti-jamming antenna operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| B3 eight-element anti-jam mode | FD-MC1815-8B3 | BEIDOU B3 |
| L1B1 eight-element anti-jam mode | FD-MC1815-8L1B1 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1815-8L1B1 | GPS L1 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:** Single interference≥110dBc ,Seven interference≥85dBc |
| FD-MC1815-8B3 | BEIDOU B3 | **B3:** Single interference≥110dBc ,Seven interference≥85dBc |

# 2 Interface Definition

## 2.1 RF Interface

1) Anti-interference signal output interface is SMA Female.

2) Output RF signal power: -63±5 dBm.

3) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1815 data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 8 | RS232_TXD | Output |
| 9 | RS232_RXD | Input |
| 5~7、10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 15 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1815 measures 150mm×150mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

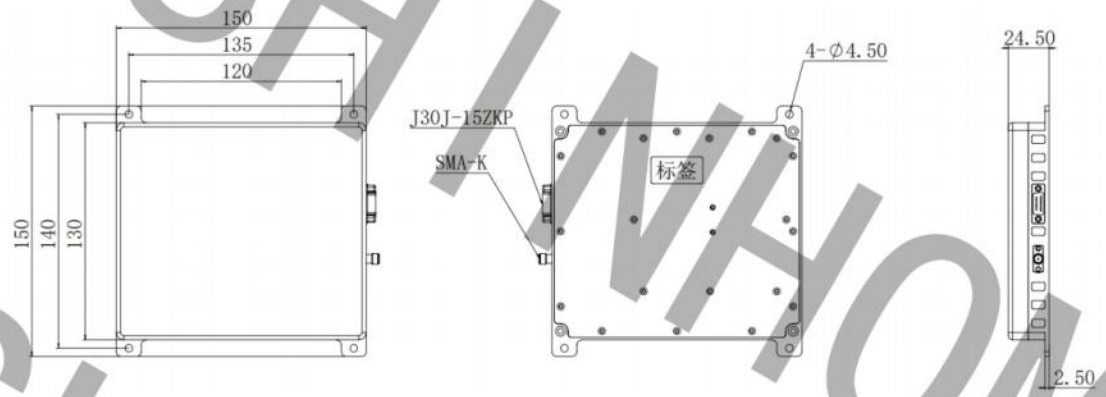



Figure 1 Dimensions Diagram of FD-MC1815

## 3.5 Weight

The FD-MC1815 weighs no more than 520g.

# 4 Typical application occasions

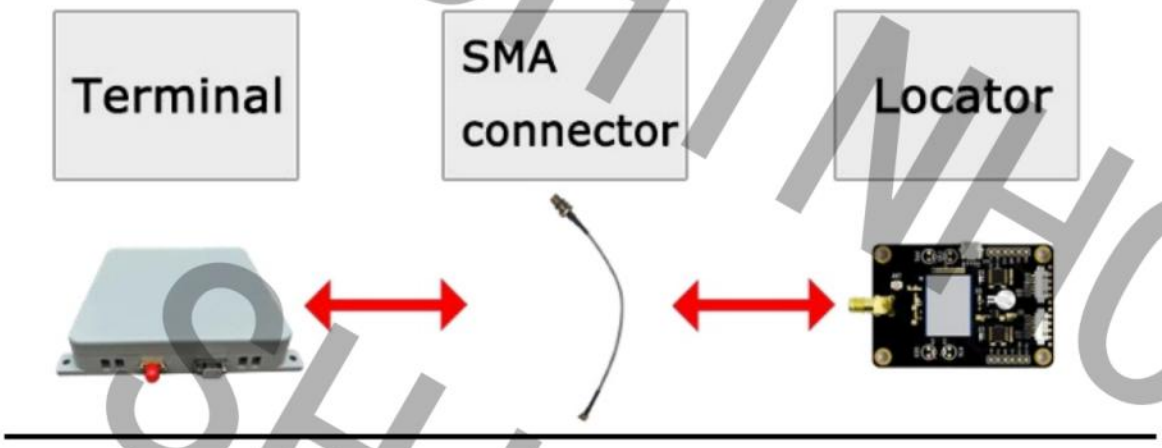
1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 5 Connection relationship description

This product replaces the conventional active antenna. When using the RF interface of the product, ensure that the interface of the access party does not provide power to the product to avoid possible power conflicts or damage. The following schematic diagram.



# 1 Feature Description

## 1.1 Introduction

FD-MC1815D is a satellite navigation eight-element (8-channel) anti-jamming receiver with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband. It can support eight-array broadband anti-jamming for BDS-B3 or BDS-B1/GPS-L1.The FD-MC1815D adopts a wide input voltage design and a fully shielded structureand.It is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC1815D uses multiple element spatial frequency adaptive filtering (SFAP).
The FD-MC1815D eight-element anti-jamming receiver operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| B3 eight-element anti-jam mode | FD-MC1815D-8B3 | BEIDOU B3 |
| L1B1 eight-element anti-jam mode | FD-MC1815D-8L1B1 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC1815D-8L1B1 | GPS L1 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:** Single interference≥110dBc ,Seven interference≥85dBc |
| FD-MC1815D-8B3 | BEIDOU B3 | **B3:** Single interference≥110dBc ,Seven interference≥85dBc |

\

## 1.4 Accuracy Specifications and Timing Characteristics

| Option | Specifications |
|---|---|
| Signal Frequency | BEIDOU B3 or GPS L1 ; BEIDOU B1 |
| Positioning Accuracy | Jamming free positioning accuracy: horizontal: 6m, elevation: 8m<br>Jamming positioning accuracy: horizontal: 10m, elevation: 10m |
| Output protocols | NMEA0183, unicore, DroneCAN，etc |
| Cold start time | ≤40S |
| Warm start time | ≤8S |
| Input voltage | 9V~36V, default 12V |

# 2 Interface Definition

## 2.1 RF Interface

1) Output RF signal power: -63±5 dBm.

2) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC1815D data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 5 | UART_TX | Receiver Serial Port Output |
| 6 | UART_RX | Receiver Serial Port Input |
| 7 | UART_GND | UART_GND |
| 8 | RS232_TXD | Anti-Jamming Serial Port Output |
| 9 | RS232_RXD | Anti-Jamming Serial Port Input |
| 10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 17 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC1815D measures 150mm×150mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

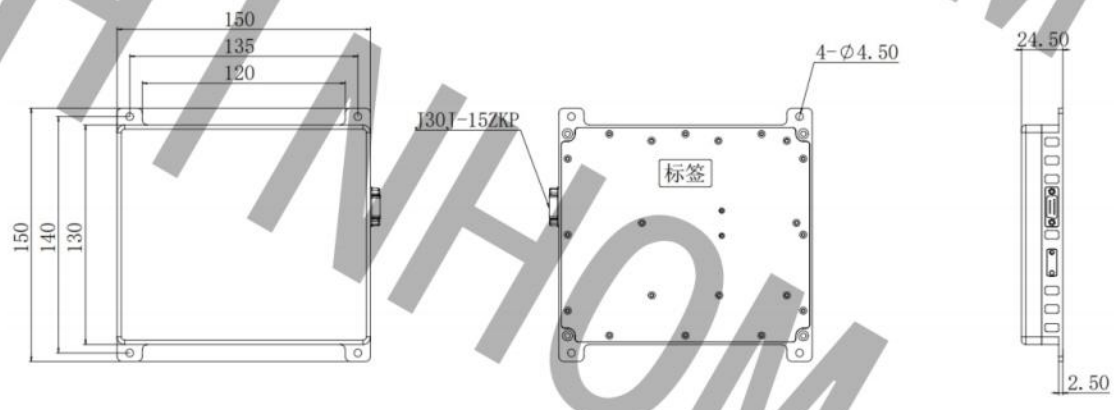



Figure 1 Dimensions Diagram of FD-MC1815D

## 3.5 Weight

The FD-MC1815D weighs no more than 600g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety
2) Convoy defense and navigation security
3) High-end logistics and navigation security

# 1 Feature Description

## 1.1 Introduction

FD-MC2413 is a satellite navigation dual four-element anti-jamming antenna with full independent intellectual property rights It can simultaneously suppress various wideband narrowband. It can simultaneously support dual four-array broadband anti-jamming for BDS-B3 and BDS-B1/GPS-L1.The FD-MC2413 is designed with a fully shielded structure and is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC2413 uses multiple element spatial frequency adaptive filtering (SFAP).
The FD-MC2413 dual quad-element anti-jamming antenna operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| dual four-element anti-jam mode | FD-MC2413-4L1B1-4B3 | GPS L1 ; BEIDOU B1、B3; GALILEO E1 |
| | FD-MC2413-4L1B1-4L2 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 |
| | FD-MC2413-4L1B1-4G1 | GPS L1 ; BEIDOU B1; GALILEO E1;GLONASS G1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC2413-4L1B1-4B3 | GPS L1 ; BEIDOU B1、B3; GALILEO E1 | **B1,L1,E1:**<br>Single interference≥110dBc ,three interference≥100dBc<br>**B3:**<br>Single interference≥110dBc ,three interference≥100dBc |
| FD-MC2413-4L1B1-4L2 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:**<br>Single interference≥110dBc ,three interference≥100dBc<br>**L2:**<br>Single interference≥105dBc ,three interference≥95dBc |

| | | |
|---|---|---|
| FD-MC2413-4L1B1-4G1 | GPS L1 ; BEIDOU B1; GALILEO E1;GLONASS G1 | **B1,L1,E1:**<br>Single interference≥110dBc ,three interference≥100dBc<br>**G1:**<br>Single interference≥90dBc ,three interference≥80dBc |

# 2 Interface Definition

## 2.1 RF Interface

1) Anti-interference signal output interface is SMA Female.
2) Output RF signal power: -63±5 dBm.
3) Output impedance 50 ohms

## 2.2 Data interface

The FD-MC2413 data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port A, and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |
| 8 | RS232_TXD | Output |
| 9 | RS232_RXD | Input |
| 5~7、10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 14 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC2413 measures 150mm×130mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

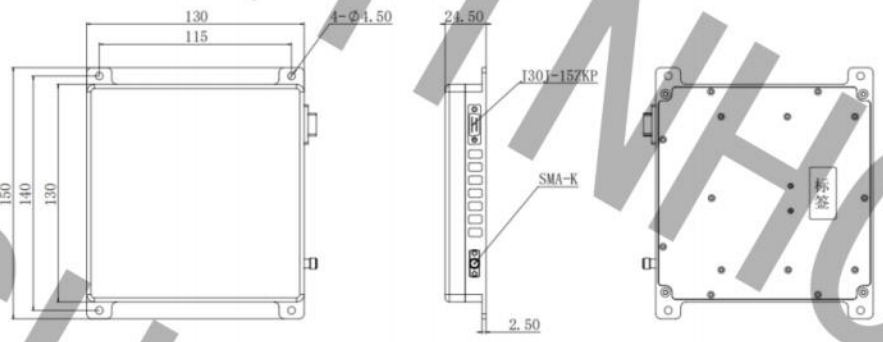



Figure 1 Dimensions Diagram of FD-MC2413

## 3.5 Weight

The FD-MC2413 weighs no more than 520g.

# 4 Typical application occasions

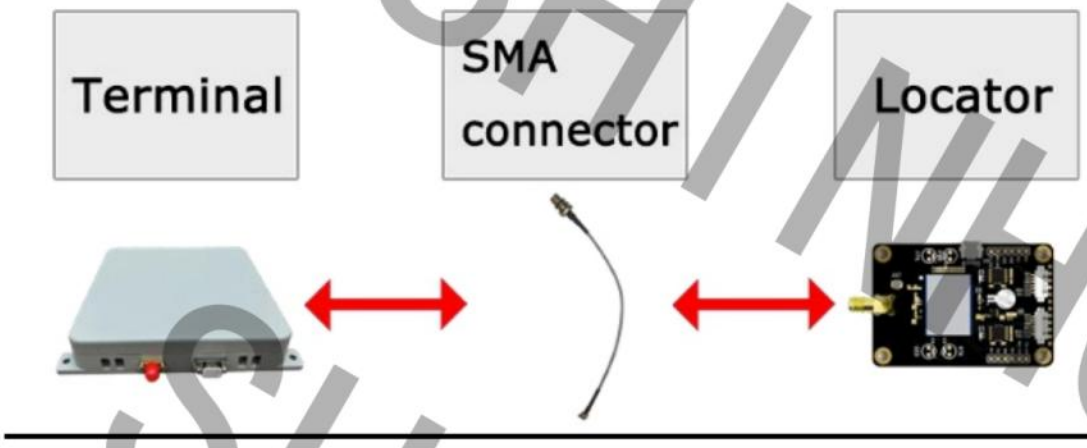
1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety

2) Convoy defense and navigation security

3) High-end logistics and navigation security

# 5 Connection relationship description

This product replaces the conventional active antenna. When using the RF interface of the product, ensure that the interface of the access party does not provide power to the product to avoid possible power conflicts or damage. The following schematic diagram.



# 1 Feature Description

## 1.1 Introduction

FD-MC2413D is a satellite navigation dual four-element anti-jamming receiver with full independent intellectual property rights. It can simultaneously suppress various wideband narrowband. It can support dual four-element broadband anti-jamming for BDS-B3 and BDS-B1/GPS-L1, with a maximum of 3 wideband interferences suppressed simultaneously for each band.The FD-MC2413D adopts a wide input voltage design and a fully shielded structureand.It is widely applicable to integrated applications in complex electromagnetic environments such as airborne and vehicle-mounted ones, featuring full functionality and high performance.

## 1.2 Function Configuration

The FD-MC2413D uses multiple element spatial frequency adaptive filtering (SFAP). The FD-MC2413D dual four-element anti-jamming receiver operates in the following mode:

| System mode | Option | Simultaneous protected Active Bands |
|---|---|---|
| dual four-element anti-jam mode | FD-MC2413D-4L1B1-4B3 | GPS L1 ; BEIDOU B1、B3; GALILEO E1 |
| | FD-MC2413D-4L1B1-4L2 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 |
| | FD-MC2413D-4L1B1-4G1 | GPS L1 ; BEIDOU B1; GALILEO E1;GLONASS G1 |

## 1.3 Key Indicators

| Option | Simultaneous protected Active Bands | Wideband Suppression(J/S) |
|---|---|---|
| FD-MC2413D-4L1B1-4B3 | GPS L1 ; BEIDOU B1、B3; GALILEO E1 | **B1,L1,E1:**<br>Single interference≥105dBc ,three interference≥95dBc<br>**B3:**<br>Single interference≥105dBc ,three interference≥95dBc |
| FD-MC2413D-4L1B1-4L2 | GPS L1、L2 ; BEIDOU B1; GALILEO E1 | **B1,L1,E1:**<br>Single interference≥105dBc ,three interference≥95dBc<br>**L2:** |

| | | |
|---|---|---|
| | | Single interference≥100dBc ,three interference≥90dBc |
| FD-MC2413D-4L1B1-4G1 | GPS L1 ; BEIDOU B1; GALILEO E1;GLONASS G1 | **B1,L1,E1:**<br>Single interference≥105dBc ,three interference≥95dBc<br>**G1:**<br>Single interference≥90dBc ,three interference≥80dBc |

## 1.4 Accuracy Specifications and Timing Characteristics

| Option | Specifications |
|---|---|
| **Signal Frequency** | BEIDOU B3 and GPS L1 ; BEIDOU B1;GALILEO E1 |
| **Positioning Accuracy** | Jamming free positioning accuracy: horizontal: 6m, elevation: 8m<br>Jamming positioning accuracy: horizontal: 10m, elevation: 10m |
| **Output protocols** | NMEA0183, unicore, DroneCAN，etc |
| **Cold start time** | ≤40S |
| **Warm start time** | ≤8S |
| **Input voltage** | 9V~36V, default 12V |

# 2 Interface Definition

## 2.1 RF Interface

1) Output RF signal power: -63±5 dBm.
2) Output impedance 50 ohms.

## 2.2 Data interface

The FD-MC2413D data interface connector uses the J30J-15ZKP. The interface is defined as follows: software can be upgraded via serial port , and interference status markers and interference power can also be output

| Pin number | Definitions | Notes |
|---|---|---|
| 1/2 | VCC | Power input: 9~36V, default 12V |
| 3/4 | GND | GND |

| | | |
|---|---|---|
| 5 | UART_TX | Receiver Serial Port Output |
| 6 | UART_RX | Receiver Serial Port Input |
| 7 | UART_GND | UART_GND |
| 8 | RS232_TXD | Anti-Jamming Serial Port Output |
| 9 | RS232_RXD | Anti-Jamming Serial Port Input |
| 10~15 | Retain | Retain |

# 3 Electrical and physical properties

## 3.1 Electrical properties

| Parameters | Minimum | Typical values | Maximum | Units | Notes |
|---|---|---|---|---|---|
| | value | | | | |
| Power supply | 9 | 12 | 36 | V | default 12V |
| Power consumption | | 15 | | W | |
| Notes | It has overvoltage protection and reverse contact protection | | | | |

## 3.2 Environmental adaptability

| Parameters | Minimum | Maximum | Units |
|---|---|---|---|
| | value | | |
| Operating temperature | -40 | 65 | ℃ |
| Storage temperature | -55 | 75 | ℃ |
| Relative humidity | Temperature: 40℃; humidity: 96% | | |

## 3.3 Color

White

## 3.4 External dimensions

The FD-MC2413D measures 150mm×130mm×24.5mm with a tolerance of ±0.2mm, and the dimensions are shown in Figure 1.

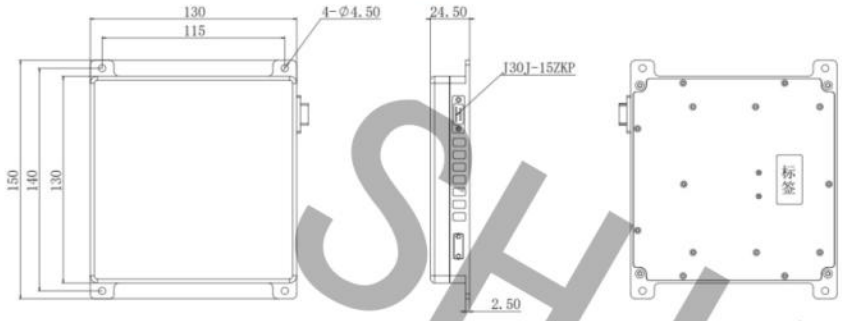



Figure 1 Dimensions Diagram of FD-MC2413D

## 3.5 Weight

The FD-MC2413D weighs no more than 540g.

# 4 Typical application occasions

1) Fix/rotary winged aircraft ,unmanned vehicles, unmanned ships and other navigation safety
2) Convoy defense and navigation security
3) High-end logistics and navigation security