Falcon Hardware Specification

Model: V3.0

Contents

1 Introduction

This specification describes properties and notice of the wireless transmission module made by Falcon.

2 Main Characteristics

No.	Parameter	Characteristics
1	Frequency	2.4GHz
2	Band width	10MHz (uplink), 10MHz(downlink)
3	Power	25dBm(Ground Unit), 25dBm(Air Unit)
4	Modulation	OFDM
5	Constellation	BPSK, QPSK
6	FEC	LDPC (1/2, 2/3, 3/4, 5/6)
7	Duplex	TDD
8	Downlink throughput	2.08Mbps ~ 6.57Mbps
9	Uplink throughput	600kbps
10	Encryption	AES256
11	Telemetry baud rate	9600/57600/115200bps
12	Configuration baud rate	115200bps
13	Interface	Ethernet, Serial
14	Weight	23.9g
15	Rated voltage/current	DC12V/1.5A (or 3S lithium battery)
16	Working temperature	-10°C ~50°C

3 Electrical Characteristics

No.	Parameter	Condition	Spec			Unit
			Min.	Typ.	Max.	
1	Consumption current	AIR	4.32	4.56	5.28	W
		GND	3.6	3.6	3.84	W
2	Center Frequency	-	2412-2467			MHZ
3	Frequency deviation	-	-25~25			PPM
4	RF output power	AIR	~25			dBm
		GND	~25			dBm
5	Unnecessary out-of-band radiation	-	2.5			uW/MHz
6	Receiving sensitivity	GND	-98~-103			dBm
		AIR	-103~-108			dBm
7	Unnecessary radiation for receiving	Fr<1Ghz	4			nW
		Fr>1Ghz	20			nW

4 Dimensions

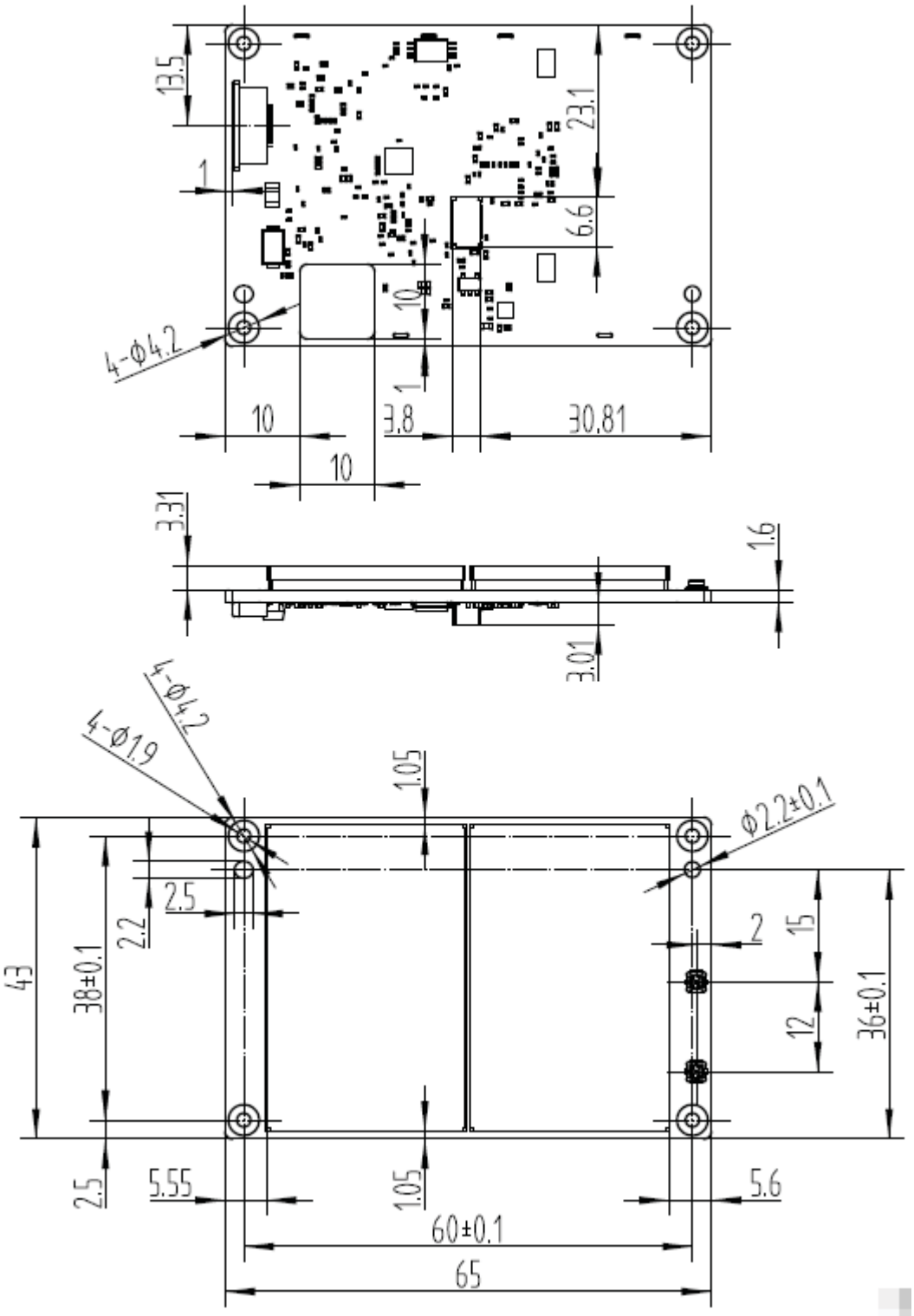

Fig.2 Dimensions (Unit: mm)

5 Connector Pins Definition

Name	Pin	Type	Description
PWR	1,2	PI	Power input(12V±5%，2A)
GND	7,8	-	Ground
UART1_TX	5	DO/NP	UART1 transmit
UART1_RX	6	DI/PU	UART1 receive
UART2_TX	3	DO/NP	UART2 transmit
UART2_RX	4	DI/PU	UART2 receive
FEA_TDP	9	AIO/PU	Ethernet in/out differential positive signal of interface 1
FEA_TDN	10	AIO/PU	Ethernet in/out differential negative signal of interface 1
FEA_RDP	11	AIO/PU	Ethernet in/out differential positive signal of interface 2
FEA_RDN	12	AIO/PU	Ethernet in/out differential negative signal of interface 2

6 Notice

1) During mounting

●Please do not use metals for a chassis setting this module.

●Please do not mount parts under this module except a specified connector.

2) During operation

●The products might receive the radio wave interference from electronic devices such as Wireless LAN devices, Bluetooth devices and so on that radiate electromagnetic wave.

●Confirm that operation temperature is within the specified range described in product specification.

●Products should be used at rated voltage.

●Check the polarity of product before power on. No reverse connecting.

●No direct contacting with water, oil, acid or alkaline.

●No crushing, nail penetrating or disassembling products.

●No discarding. Dispose based on the local policy and law.

3) Storage

●No storage in a condition with a relative humidity exceeding 85% or with corrosive gases. It is easy to cause the damage and corrosion of the module, resulting in disconnection.

●For long-term storage, place the product in a well-ventilated condition at -10°C ~50°C, with a relative humidity below 85%.

FCC Statement:

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement:

For mobile use:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

For portable use:

The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure of low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by additional research. Falcon has been tested and found to comply with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines.

List of applicable FCC rules

This module has been tested and found to comply with Part15C, Section 15.247 requirements for Modular Approval.

End Product Labeling

The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2A8JK-FIDES-LINK”. The grantee's FCC ID can be used only when all FCC compliance requirements are met. The end product shall bear the following 15.19 statement: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users. Antenna Specification list below:

Antenna Type	M/N	Frequency Band (MHz)	Antenna Gain (dBi)
Omni Antenna	YMC.Controller.ANT1.V2.C113.187B.1	2400~2500	2.6
Omni Antenna	YMC.Drone.ANT1.C113.382B.1	2400~2480	3.0

This device is intended only for OEM integrators under the following conditions: (For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information / warning as show in this manual.

The host integrator must follow the integration instructions provided in this document and ensure that the composite-system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB 996369.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

How to make changes:

Only the grantee is permitted to make permissive changes. Please contact us at ACSL Ltd. (https://www.acsl.co.jp/en/)