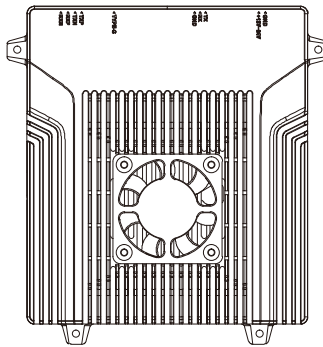
# TC-50
# Data & Image Transmitter

Technical Specification Sheet



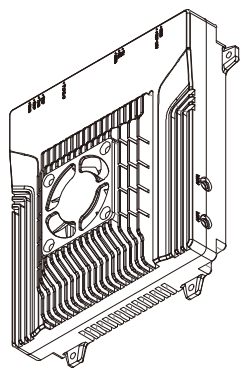
Version: V1.7
Update Date: 2025-6-6

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# 1. Product Overview

TC-50 is a wireless broadband data transmission module.It is based on the LTE wireless communication standard, and adopts key technologies such as OFDM and TDD, supports multiple bandwidth allocations (1.4MHz、3MHz、5MHz、10MHz、20MHz). And it has a flat system architecture design, which effectively reduces system delays and improves system transmission capabilities. It has the characteristics of long transmission distance, large data throughput and strong anti-interference.

TC-50 adopts SOC chips to improve integration, greatly reduce system power consumption and reduce module size. It provides users with a dedicated communication solution with large bandwidth, low latency, and anti-interference. And it supports data transmission needs of unmanned equipment such as UAV and unmanned boat, as well as emergency equipment and wireless monitoring products.



The hardware information in this spec sheet is also applies to the following products:

**Table 1: Product list**

| NO. | Model | Illustration |
|---|---|---|
| 1 | TC-30 | Supports distance of 30KM |
| 2 | TC-50 | Supports distance of 50KM |
| 3 | TC-80 | Supports distance of 80KM |
| 4 | TC-100 | Supports distance of 100KM |
| 5 | TC-150 | Supports distance of 150KM |

# 2. Features

| | |
|---|---|
| Supports distance transmission | The maximum transmission distance is up to 50KM |
| Supports large bandwidth transmission | The maximum uplink and downlink supports 30Mbps@20MHz |
| Supports automatic frequency selection | Automatically detects interference signals, and selects the optimal frequency in real time. |
| Supports automatic retaransmission | Supports HARQ automatic retransmission mechanism to improve data reliability. |
| Supports adaptive code stream | Automatically adjusts channel modulation mode according to signal quality in real time. |
| Supports automatic power control | Automatically adjusts transmission power at close range to reduce power consumption. |
| Supports OTA upgrade | Supports OTA upgrade |

| | |
|---|---|
| Supports WEBUI configuration | Supports basic configuration/reporting/query functions through WEBUI |
| Supports uplink and downlink ratio configuration | The uplink and downlink time slot ratio of the central node supports 2D3U/3D2U/4D1U/1D4U |
| Supports star networking | Up to 16 access nodes |

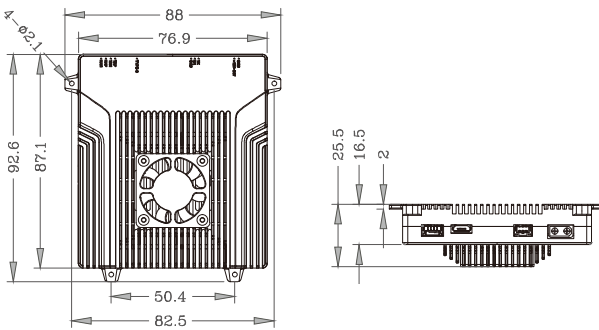
# 3. Mechanical Specifications

## 3.1 Dimensions

92.7 x 88 x 25.5mm

## 3.2 Weight

Module N.W.: 155g



# 4. Product Specifications

4.1 System Specifications

| Items | Technical Specification | Remarks |
|---|---|---|
| Working frequency | 1427.9-1447.9MHz | |
| RF channel | Supports single-transmit dual-receive (1T2R) | |
| Transmit power | 2W | |
| Networking mode | Star networking, maximum 1+16 nodes | |
| Receiving sensitivity | 20MHz -99 dBm<br>10MHz -103 dBm | Access sensitivity |
| | 20MHz -97dBm (5Mbps)<br>10MHz -96dBm (5Mbps) | BLER<=3% Sensitivity |
| Transmission distance | Air-to-ground:10KM,30KM,50KM,150KM<br>Select the corresponding model according to Table 1 | |
| Signal channel bandwidth | 1.4MHz/3MHz/5MHz/10MHz/20MHz | |
| Modulation mode | QPSK/16QAM/64QAM | |
| Maximum rate | Uplink and downlink share 30Mbps | |
| Communication encryption | ZUC, SNOW3G and AES128<br>3 encryption methods are optional | |
| Transmission mode | Supports unicast,multicast and broadcast | |

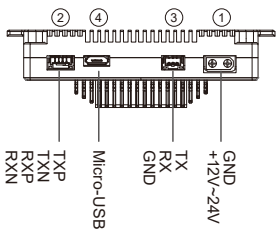
| Items | Technical Specification | Remarks |
|---|---|---|
| Transmission delay | Boot delay 15s<br>Average ping packet delay between two nodes <=15ms | DRX Closed |
| Service interface | UART*1 | |
| | 100M Ethernet interface | |
| Antenna interface | MMCX*2 | |
| Power control | The slave node supports adaptive power control.The central node supports fixed power. | |
| Transmission mode | The central node supports 2D3U/3D2U/4D1U/1D4U uplink and downlink time slot rations. | Different models are distinguished |
| System control | Supports real-time changes in transmission power/frequency/bandwidth. | |
| Configuration management | Supports basic configuration/reporting/ query functions through WEBUI. | |
| Frequency hopping | Supports dynamic frequency hopping. | |
| Mode switching | Supports configuration of point-to-point and point-to-multipoint networking mode switching. | |

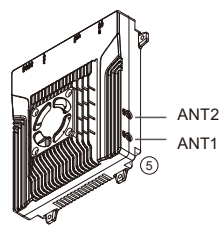
## 4.2 Power Consumption

Average power consumption at maximum rate: 18W

# 5. Interface Definition

| Interfaces | Connector | Serial No. |
|---|---|---|
| Power | XT-30 | ① |
| Ethernet | | ② |
| Transparent Serial Port | | ③ |
| OTA Upgrade | Micro-USB interface | ④ |
| Antenna Interface | MMCX | ⑤ANT1: Main Ant (The antenna must be connected.)<br>ANT2: Sec Ant (Receive auxiliary antenna.) |



# 6. Hardware Features

## 6.1 Electrical Characteristics

| Items | Specification | Minimum | Average | Maximum |
|---|---|---|---|---|
| System main power supply | VCC | 24V | 24V | 45V |

## 6.2 Protection Level

| Items | Description |
|---|---|
| ESD | The contact ESD level of all pins is ±1KV.<br>The contact ESD level of Antenna pins is ±4KV.<br>The non-contact ESD level of Antenna pins is ±8KV. |

## 6.3 Reliability Specifications

| Items | Description |
|---|---|
| Temperature | Working temperature: -20°C～75°C<br>Storage temperature: -40°C～85°C |
| Humidity | 5%～95% (No condensation) |

## 6.4 MSD Level

| Items | Description |
|---|---|
| MSD Level | Level 3 (Moisture sensitive devices). |

## 6.5 Environmental Standards

| Items | Description |
|---|---|
| RoHS | Yes |

# 7. Package Contents

| NO. | Items | Qty./PCS | Remark |
|---|---|---|---|
| 1 | TC-50 Module | 2 | 1* Air Unit<br>1* Ground Unit |
| 2 | 1.4G Omnidirectional antenna, gain 2dBi | 2 | SMA male connector ( inner threaded pin) for air end use. |
| 3 | 1.4GHz spring-loaded omnidirectional antenna, gain 5dBi | 2 | N-type male connector ( inner threaded pin) for ground end use. Optional 10dBi omnidirectional antenna or directional antenna. |
| 4 | Suction cup (for antenna installation) | 2 | SMA-male (inner threaded pin) to N-female (outer threaded socket) |
| 5 | RF Jumper Cable | 4 | MMCX-male to SMA-female (Outer threaded socket) |
| 6 | Power cable | 2 | XT30U-F cable |
| 7 | Ethernet cable | 2 | GH-4P to RJ45 |
| 8 | Data transmission cable | 2 | GH-39 to XH2.54(female) |

Note:

4 The suction cup is a fixing accessory for the ground spring antenna and will change according to the ground antenna model.