

Micro-nano Satellite Integrated Electronics

Abstract:

This command describes the appearance features, technical specifications, interface definitions and communication protocols of Micro-nano Satellite Integrated Electronics.

Key Words: Micro-nano, Satellite, Integrated Electronics, Specification, Interface

1. Appearance

The appearance of Integrated Electronics is shown as figure1.



Fig.1 Micro-nano Satellite Integrated Electronics

2. Specifications

Table1 Specifications

Item	Parameter	Remark
CPU	ARM	dual cold backup
Main frequency	180MHz	
Data memory	4MB	
Program memory	64MB	
Data bus interface	CAN data bus, 500Kbps	
Uplink telecommand	2000bps	
Downlink telemetry	16Kbps	
pulse per second signal interface	1 channel	
RS422 interface	11 channel, 115200bps	
TT&C system	USB	
Data storage	1024Gbit; support modes of recording, replaying, replaying while recording, self-checking	
Payload data interface	LVDS, 6 channel with each 1.6Gbit	
Telemetry acquisition	28 channel of temperature	number configurable

channel	parameter, 6 channel of analog parameter	
OC command	16 channel, driving capability 200mA, pulse width 160±10ms	number configurable
Temperature control channel	22 channel, with power of single channel no less than 12W	number configurable

3. Mechanical Interfaces

Table2 Specifications

Item	Parameter	Remark
Outline size	254mm×240mm×210mm	
Weight	< 4.0Kg	
Mounting aperture	6-Φ5.5mm	

4. Power Requirements

+13V, +5.5V DC power supply

Table3 Power Requirements

Item	Parameter	Remark
Power supply	+5.5V, +13V(for heating)	
Inrush current	4A/10ms	
Steady power consumption	<17.5W	
Peak power consumption	<20W	

5. Interface Definitions and Communication Protocols

5.1 communication interface

Integrated Electronics adopts card-box design, including CAN data bus and RS422 data bus.

1) CAN data bus interface

CAN communication rate 500Kbps, receiver input impedance: 5 to 10KΩ, differential input impedance: 20 to 100KΩ. The circuit interface is shown as figure2.

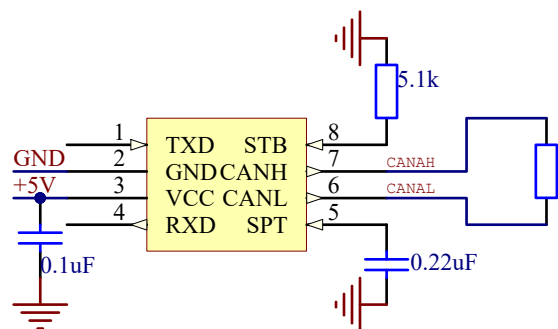


Fig.2 CAN data bus interface

2) RS422 input interface

Asynchronous Serial Interface, pulse per second signal receiving logic signal. The interface chip adopts AM26C32. The circuit interface is shown as figure3.

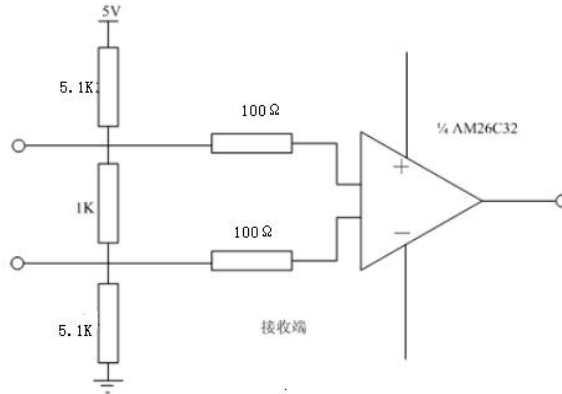


Fig.3 RS422 input interface

3) RS422 output interface

Asynchronous Serial Interface, pulse per second signal output logic signal. The interface chip adopts AM26C31. The circuit interface is shown as figure4.

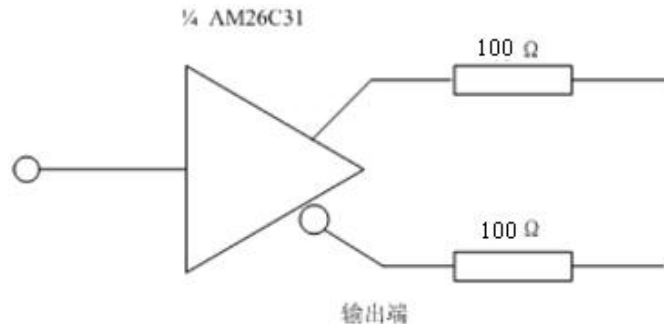


Fig.4 RS422 output interface

5.2 communication protocols

RS422 adopts standard asynchronous serial interface communication protocol, with 1 start bit, 8 data bits, 1 stop bit, and the data content is determined by users.

CAN data bus comply with CAN2.0A protocol. The data content is determined by users.

6. Fault Identification

If the following phenomena happen in the process of installation testing, it indicates that Integrated Electronics has faults. Please contact supplier to solve the problems:

- There are obvious damage signs on the appearance, including serious

scratch, knock mark, component loss, etc.

- There are damages to electrical interface. The impedance is less than $1\text{K}\Omega$ when measuring power supply and ground return lines with multimeter.
- The static operating current is greater than 1A after power-on under normal temperature and pressure.
- Data bus can't receive (send) data or receive (send) error data.

7. Maintenance

Dedicated person should be designated for routine maintenance of Integrated Electronics.

- The input power supply of Integrated Electronics are +5.5V, +13V DC. No one shall be allowed to change that.
- The type, specification, and parameter of components in circuits shall not be changed in the process of usage or maintenance. If faults happen, please contact supplier.
- Installations must be firm without breaking off.
- Transportation shall comply with waterway, land route transportation and loading requirements, avoiding collision, water, and corrosion.