



司南导航

Technical Specification / 技术规范

U70 DataLink Module

U70 数传模块

2022-05-01

REVISION HISTORY / 修订历史

REVISION / 版本	MODIFICATION / 更改	DATE / 日期
1.3	更新 COM1 口说明	2022-05-01
1.2	修改了信道间隔、空中波特率	2021-08-12
1.1	特别说明只有 COM1 支持升级功能	2021-05-31
1.0	New Release / 新发	2020-09-10

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I. INTRODUCTION / 简介

U70 is a high performance wireless datalink module that specially designed for GNSS differential data transmission by ComNav Technology Ltd. The advanced technology of using advanced CSS digital modulation and demodulation technology, integrating receiving and transmitting functions make it suitable for RTK real time data transmission. Then, it has the advantage of stable output power, high receiving sensitivity, low error rate and strong anti-interference ability. Besides, its characteristics of small size, low power consumption, better electromagnetic compatibility, pin type interface, and modular design are in favor of system integration.

U70 数传模块是上海司南卫星导航技术股份有限公司专为 GNSS 差分数据传输设计的高性能数传模块，采用先进的 CSS 数字调制解调技术，集接收和发射功能于一体，适用于 RTK 实时数据传输；并具有输出功率稳定、接收灵敏度高、低误码率、抗干扰能力强等优点，确保恶劣环境下能正常工作。它体积小、功耗低、电磁兼容性好、贴片式接口设计、模块化设计，便于各种系统集成。

II. SPECIFICATION OF U70 DATALINK MODULE / U70 数传模块技术规范

Following table presents the detailed specification of ComNav U70 Datalink board. Specific technical characteristics are listed with its physical interface and electrical parameters.

下表中为司南 U70 数传的详细规范。同时，还列出了该板卡的各项技术性能，以及它的物理接口和电气接口参数。

Table 1. U70 Specification

U70 SPECIFICATION/ U70 规范	
信道间隔 Channel spacing	250KHz
工作模式 Work pattern	半双工 Half-duplex
频率稳定度 Frequency stability	1.5ppm
调制方式 Modulation system	CSS

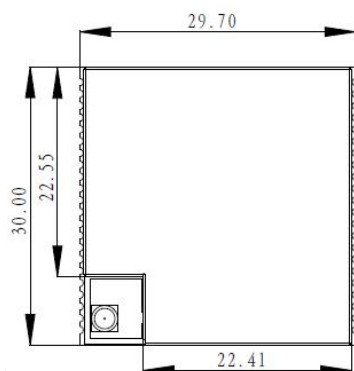
U70 SPECIFICATION/ U70 规范		
空中波特率 Air baud rate	500bps/11000bps/12500bps/15500bps/18000bps	
协议类型 Protocol type	LoRa	
串口波特率 Serial port baud rate	4800/9600/19200/38400/115200bps	
每秒最大收发数据大小 Max send and receive data length per second	1000Byte	
电气特性 Electrical characteristics	供电范围 Power supply range	+3.3V ~ +3.6V DC
	接收电流 Receive Current	50mA
	发射电流 Emission Current	<2A
	发射功率 Transmit Power	33dBm ± 1.5dB
物理特性 Physical characteristics	通讯接口 Communication interface	2x22Pin, Pin pitch 1.27mm (引脚间距 1.27mm)
	天线接口 Antenna interface	IPEX-K (IPEX 母头)
	尺寸(含接头) Size (with connectors)	30x30x3mm
	重量 Weight	8g
环境特性 Environmental characteristics	工作温度 Operating Temperature	-35°C ~ +65°C
	储存温度 Storage Temperature	-45°C ~ +85°C

III. DIMENSION / 尺寸

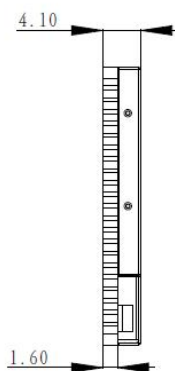
In this section, three-side views and the dimension of U70 are provided for customers' further hardware design and installation.

本节提供了 U70 的三视图和对应的物理尺寸，便于用户的进一步系统硬件设计和安装。

U70 Top View/顶视图



U70 SideView/侧视图



U70 Bottom View/底视图

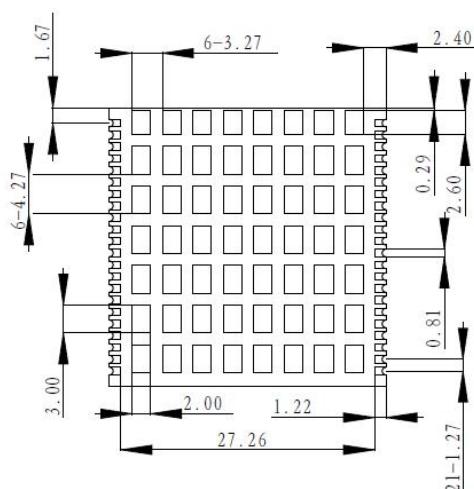


Figure 1. U70 Dimension View

图 1. U70 尺寸图

IV. PIN ARRANGEMENT AND DEFINITION / 引脚标识和定义

U70 has 44-Pin pad (22 Pin, 1.27mm Dual Pad).

GND	1	44	GND
USBDP	2	43	JTMS
USBDM	3	42	JTDO
JNTRST	4	41	JTDI
GPIO1	5	40	JTCK
GND	6	39	GND
GPIO2	7	38	NRST
NC	8	37	GPIO11
NC	9	36	NC
GND	10	35	GND
GPIO3	11	34	GPIO10
GPIO4	12	33	GPIO9
NC	13	32	COM3_RXD
NC	14	31	COM3_TXD
GPIO6	15	30	COM2_RXD
GPIO5	16	29	COM2_TXD
GND	17	28	COM1_RXD
GPIO7	18	27	COM1_TXD
GPIO8	19	26	GND
GND	20	25	GND
NC	21	24	PWR
GND	22	23	PWR

Figure 2. U70 has 44-Pin pad (22 Pin, 1.27mm Dual Pad)

图 2. U70 数传模块包括 44 连接焊盘（引脚间距 1.27mm，双列）

Table 2. Pin Definition of U70 44-Pin pad

PIN	SIGNAL	TYPE	DESCRIPTION	
1	GND	GND	Ground Reference	系统接地
2	USBDP	IO	USB interface data (+)	USB 数据信号 (+)
3	USBDM	IO	USB interface data (-)	USB 数据信号 (-)
4	JNTRST	I	JTAG RESET	JTAG 复位
5	GPIO1	IO	General-purpose input/output	通用输入输出
6	GND	GND	Ground Reference	系统接地
7	GPIO2	IO	General-purpose input/output	通用输入输出
8	NC	/	Not Connected	悬空
9	NC	/	Not Connected	悬空
10	GND	GND	Ground Reference	系统接地
11	GPIO3	IO	General-purpose input/output	通用输入输出
12	GPIO4	IO	General-purpose input/output	通用输入输出
13	NC	/	Not Connected	悬空
14	NC	/	Not Connected	悬空
15	GPIO5	IO	General-purpose input/output	通用输入输出
16	GPIO6	IO	General-purpose input/output	通用输入输出
17	GND	GND	Ground Reference	系统接地
18	GPIO7	IO	General-purpose input/output	通用输入输出
19	GPIO8	IO	General-purpose input/output	通用输入输出
20	GND	GND	Ground Reference	系统接地
21	NC	/	Not Connected	悬空
22	GND	GND	Ground Reference	系统接地
23	VCC	PWR	POWER	系统电源
24	VCC	PWR	POWER	系统电源
25	GND	GND	Ground Reference	系统接地
26	GND	GND	Ground Reference	系统接地

PIN	SIGNAL	TYPE	DESCRIPTION	
27	COM1_TX	O	COM1_TX	COM1 串口输出 (暂时不支持数据传输,仅 COM1 支持升级)
28	COM1_RX	I	COM1_RX	COM1 串口输入
29	COM2_TX	O	COM2_TX	COM2 串口输出
30	COM2_RX	I	COM2_RX	COM2 串口输入
31	COM3_TX	O	COM3_TX	COM3 串口输出
32	COM3_RX	I	COM3_RX	COM3 串口输入
33	GPIO9	IO	General-purpose input/output	通用输入输出
34	GPIO10	IO	General-purpose input/output	通用输入输出
35	GND	GND	Ground Reference	系统接地
36	NC	/	Not Connected	悬空
37	GPIO11	IO	General-purpose input/output	通用输入输出
38	NRST	IO	Reserve for use	预留
39	GND	GND	Ground Reference	系统接地
40	JTCK	I	JTAG TCK	JTAG 时钟输入
41	JTDI	I	JTAG TDI	JTAG 数据输入
42	JTDO	O	JTAG TDO	JTAG 数据输出
43	JTMS	I	JTAG TMS	JTAG 模式选择
44	GND	PWR	Ground Reference	系统接地

REMARKS / 说明:

1. Electronic characteristic/电气特性

COM1_Tx, COM1_Rx, COM2_Tx, COM2_Rx, COM3_Tx, COM3_Rx are LVCMOS 3.3V.

COM1_Tx, COM1_Rx, COM2_Tx, COM2_Rx, COM3_Tx, COM3_Rx为LVCMOS 3.3V电气标准。

LVCMOS 3.3V电气标准

Symbols 符号	Description 描述	Min 最小	Max 最大
V _{IH}	Input high voltage 输入高电压	2V	3.6V
V _{IL}	Input low voltage 输入低电压	-0.3V	0.8V
V _{OH}	High-level output voltage 高电平输出电压	2.9V	--
V _{OL}	Low-level output voltage 低电平输出电压	--	0.4V
I _{OH}	Sourcing current 拉电流	8mA	
I _{OL}	Sinking current 灌电流	8mA	

2. Absolute maximum rating is -0.3V~3.6V of following signals:/所能承受电压的最大值范围是-0.3V~3.6V的信号如下:

COM1_Tx, COM1_Rx, COM2_Tx, COM2_Rx, COM3_Tx, COM3_Rx.

3. USB

Currently, U70 has no function of full USB devices.

U70目前暂时不支持全速USB。

4. VCC

Main power supply, voltage range is 3.3VDC~3.6V DC.

Voltage ripple and spike requirement: <100mV

主供电电源（输入），电压范围：3.3V~3.6V（直流）。电压纹波和尖峰脉冲需求：<100mV。

5. Thermal

U70 need use heat dissipation for fever.

U70需要设计良好的散热设计来保障模块的正常运行。

V. APPLICATION CONNECTION EXAMPLE / 应用连接示例

In this section, an application connection example of U70 datalink board is presented via specific schematic diagrams. Per the instruction of these diagrams, you could easily build the communication circuits between U70 datalink module and other terminals such as PC, GPRS or Bluetooth module, and some other devices with an UART.

本部分以具体电路的形式提供一个 U70 数传模块应用连接示例。参照下面的图示，您可以很方便建立 U70 数传模块和其他终端（如 PC，GPRS 模块，蓝牙模块或其他带有 UART 的设备）之间的通讯电路。

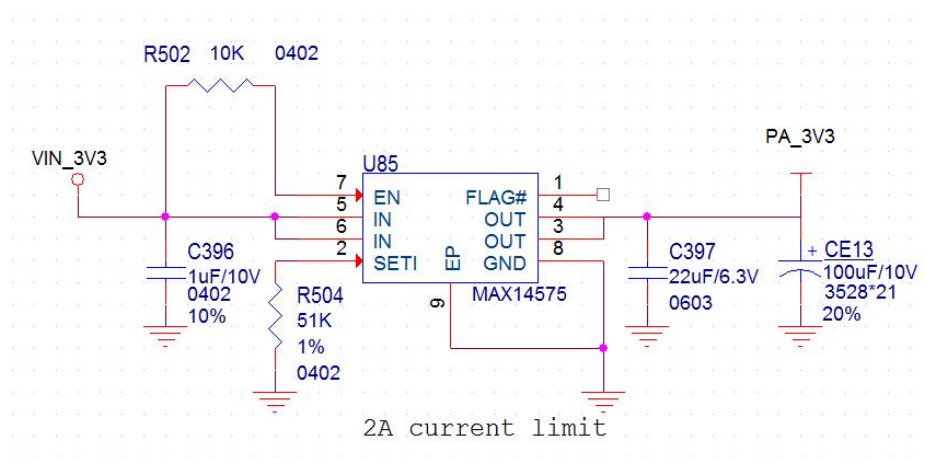


Figure 3. U70 Limiting Current

图 3. U70 限流设计示意

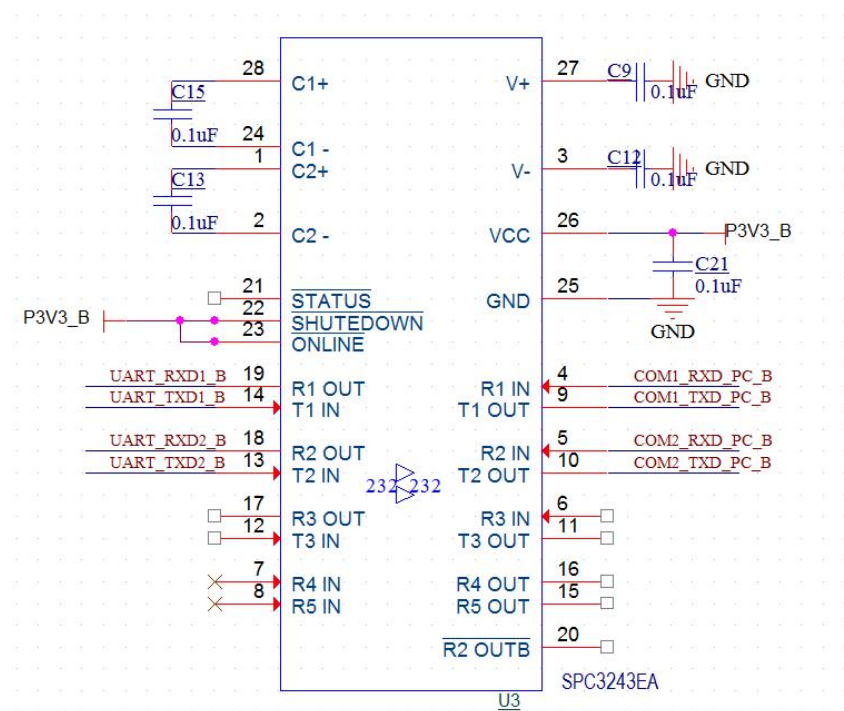


Figure 4. Connections between COM of U70 and some other Devices with an UART

图 4. U70 COM 与其他使用 UART 接口的设备之间的连接原理图

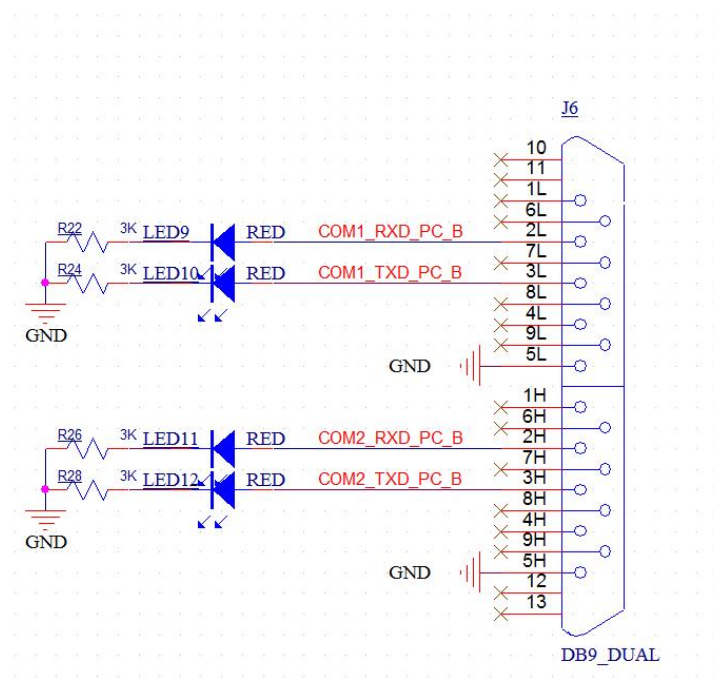


Figure 5. Connection of U70 COM Connector to PC

图 5. U70 COM 与电脑连接原理图