



司南导航

Product Specification/产品规范

K700 OEM Board

K700 OEM 板卡

2015-09-22

REVISION HISTORY/修订历史

REVISION/版本	MODIFICATION/更改	DATE/日期
1.0	New Release/新发	2015-09-22

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I. INTRODUCTION / 简介

ComNav K708 is a high precision positioning GNSS multi-system OEM board based on a self-developed ASIC baseband chip (SNB1008). It has superior dynamic performance and reliable pseudorange differential analysis capability.

上海司南 K700 OEM 板卡是一款基于自主研发的 ASIC 基带芯片（SNB1008）的 GNSS 多系统高精度定位板卡。该板卡拥有优越的动态捕捉性能及可靠的伪距差分解算能力。

II. SPECIFICATION OF K700 OEM BOARD / K700 OEM 板卡技术规范

Following table presents the detailed specification of ComNav K700 OEM board. Specific technical characteristics are listed with their physical interfaces and electrical parameters.

下表中为司南 K700 OEM 板卡的详细规范。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. K700 Specification

K700 SPECIFICATION / K700 规范			
GNSS Signals GNSS 信号	Positioning 定位	GPS L1C/A	14 GPS satellite tracked at the same time 可同时跟踪 14 颗 GPS 卫星
		BDS B1I	14 BDS satellite tracked at the same time 可同时跟踪 14 颗 BDS 卫星
		GLONASS G1C ^{Note 1}	14 GLONASS Satellites Tracked at the same time 可同时跟踪 14 颗 GLONASS 卫星
		SBAS L1C/A	4 SBAS Satellites Tracked at the same time 可同时跟踪 4 颗 SBAS 卫星
Time to First Fix 首次定位时间	Cold 冷启动	< 50s	
	Warm 温启动	< 45s	
Reacquisition 信号重捕		< 3s	
Measurement	Pseudorange Precision	GPS: L1 = 10cm	

K700 SPECIFICATION / K700 规范		
Precision 测量精度	伪距精度	BDS: B1 = 10cm GLONASS: G1=20cm
	Carrier Phase Precision 载波相位精度	GPS: L1 = 1.0mm BDS: B1 = 1.0mm GLONASS: G1=1.0mm
Positioning and Time Accuracy 定位与授时精 度	Time Accuracy 授时精度	20ns
	SPP Accuracy 标准单点定位精度	Single-frequency/单频: H≤3m, V≤5m (1σ, PDOP≤4)
	Static Differential Accuracy (Supported by Compass Solution) 静态差分精度 (Compass Solution 软 件支持)	H: ±(2.5 + 1×10 ⁻⁶ ×D)mm V: ±(5 + 1×10 ⁻⁶ ×D)mm
RTK/RTD Performance RTK/RTD 性能	RTD Pseudorange Differential Accuracy 伪距差分精度	H: ±0.5m V: ±1.0m
	RTK Initialization time RTK 初始化时间	< 15s (baseline<5km, 基线长小于 5km)
	Initialization Reliability 初始化置信度	> 99.9%
	RTK Accuracy RTK 精度	H: ±(10 + 1×10 ⁻⁶ ×D)mm V: ±(20 + 1×10 ⁻⁶ ×D)mm
Data Rates 数据速率	Measurements & Position 测量&定位	1Hz, 2Hz, 5Hz, 10Hz, 20Hz, 50Hz,100Hz (Max)
Electrical 电气特性	Voltage 供电电压	+3.3V ~ +5.5V ±5%VDC
	Power Consumption (no antenna connected)	0.6W

K700 SPECIFICATION / K700 规范		
	功耗 (未接天线)	
Environmental 环境要求	Operating Temperature 工作温度	-40°C — +80°C
	Storage Temperature 储存温度	-55°C — +95°C
Data Formats 输出数据格式	NMEA-0183	GPGGA, GPGGARTK, GPGSV, GPGLL, GPGSA, GPGST, GPHDT, GPRMC, GPVTG, GPZDA etc.
	BINEX	0x00, 0x01-01, 0x01-02, 0x01-05, 0x7d-00, 0x7e-00, 0x7f-05
	ComNav Binary 司南二进制格式	ComNav Self-Defined 司南自定义
	CMR(GPS)	CMROBS, CMRREF
	RTCM2.X	RTCM1, RTCM3, RTCM1819, RTCM59, RTCM31
	RTCM3.0	1004, 1005, 1006, 1007,1008, 1011,1012, 1104, 1033,
	RTCM3.2 MSM4	1074, 1084, 1124
	Other	PTNL,PJK; PTNL,GGK; PTNL,AVR; NAVPOS
Antenna Interface 天线接口	Antenna Connector 天线连接器	MCX female (MCX 母头), 50Ω
	LNA Power (Internal) 天线供电电压	+3.3V ~ +5V ±5%VDC @ 0-100mA
Hardware Interface 硬件接口		2×12 pin male connector (24 针公头) pin pitch 2mm (针脚间距 2mm)
Physical 物理参数	Size 尺寸	71.1mmX40.7mmX10.6mm with connectors (含接头)
	Weight 重量	18 grams 克

Note 1

Some of K700 OEM boards don't support GLONASS.

某些 K700 板卡不支持 GLONASS。

III. DIMENSION / 尺寸

In this section, three-side views and the dimension of K700 is provided for customers' further hardware design and installation.

本节提供了 K700 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。

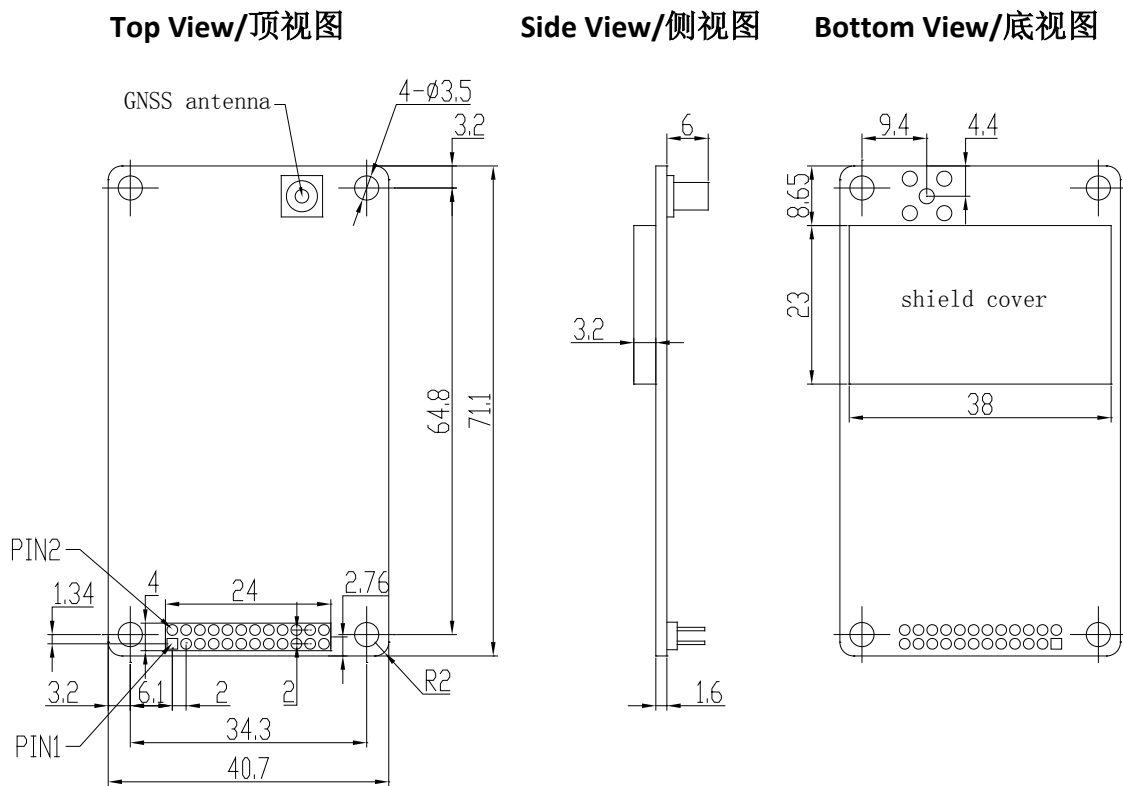


Figure 1. K700 Dimension View

TIPS 提示:

The copies of four AutoCAD dwg files as shown in Figure 1 can be obtained from the attachment of this document, which can be imported into EDA tools directly facilitating your system hardware design.

该文档的附件包含上面的 AutoCAD dwg 文件，可直接导入 EDA 软件用于系统硬件设计。

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

K700 has one 24-Pin^{Note1} connector (12 Pin, 2mm Dual Row vertical T/H HDR). Pin definitions of K700 is listed in Table 2 respectively.

K700 板卡包括 24 针接头（针脚间距 2mm，双排）。表 2 为这些引脚的具体定义。

Table 2. K700 24-Pin Definition

PIN	SIGNAL	TYPE	DESCRIPTION	
1	RFU	N/A	Reserved for use	预留
2	RFU	N/A	Reserved for use	预留
3	LNA_PWR	PWR	Antenna power Supply	天线供电
4	VIN	PWR	Supply voltage input	电源电压输入
5	NC	N/A	No Connection	未连接
6	COM3_Rx	Input	UART3 RX	COM3 串口输入
7	RESETIN	Input	System reset	系统复位
8	RFU	N/A	Reserved for use	预留
9	Event	Input	EVENT mark	外部事件输入
10	RTK_LED	Output	RTK data LED indicator	RTK 数据指示灯
11	COM3_Tx	Output	UART3 TX	COM3 串口输出
12	GND	PWR	Ground reference	系统接地
13	COM1_Tx	Output	UART1 TX	COM1 串口输出
14	COM1_Rx	Input	UART1 RX	COM1 串口输入
15	GND	PWR	Ground reference	系统接地
16	COM2_Tx	Output	UART2 TX	COM2 串口输出
17	COM2_Rx	Input	UART2 RX	COM2 串口输入
18	GND	PWR	Ground reference	系统接地
19	RFU	N/A	Reserved for use	预留
20	GND	PWR	Ground reference	系统接地
21	PPS	O	Pulse Per Second	秒脉冲

PIN	SIGNAL	TYPE	DESCRIPTION
22	SAT_LED	O	Tracked satellite number indicator 跟踪卫星数量指示灯
23	RFU	N/A	Reserved for use 预留
24	RFU	N/A	Reserved for use 预留

NOTE 1:

K700 OEM board has 24 pins. Pin 3 to 22 of K700 OEM board have the same definition and position as pin 1 to 20 of K500 OEM board.

K700 OEM 板卡有 24 个针脚。K700 OEM 板卡 3~22 针脚和 K500 板卡 1~20 针脚位置和针脚定义一样。Note 1

REMARKS/说明:

1. Electronic characteristic/电气特性

RTK_LED, SAT_LED, RESETIN, COM1_Tx, COM1_Rx, COM2_Tx, COM2_Rx, COM3_Tx and COM3_Rx are LVCMOS 3.3V compatible. All these signals are compatible with LVCMOS/LVTTL 3.3V

RTK_LED, SAT_LED, RESETIN, COM1_Tx, COM1_Rx, COM2_Tx, COM2_Rx, COM3_Tx, COM3_Rx是兼容3.3 V的。所有这些信号兼容LVCMOS / LVTTL 3.3 V

Symbols 符号	Description 描述	Min 最小	Max 最大
V _{IH}	Input high voltage 输入高电平	2V	3.6V
V _{IL}	Input low voltage 输入低电平	-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. PPS and EVENT are LVTTL 3.3V compatible. All these signals are compatible with LVCMOS/LVTTL 3.3V

PPS和EVENT为LVTTL 3.3 V电平，所有这些信号兼容LVCMOS / LVTTL 3.3V

Symbols/符号	Description/描述	Min/最小	Max/最大
V_{IL}	Input low voltage 输入低电平	-0.3V	0.8V
V_{IH}	Input high voltage 输入高电平	2V	3.45V
V_{OH}	High-level output voltage 高电平输出电压	2.4V	---
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	

3. 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:

RTK_LED, PPS, COM1_Rx, COM1_Tx, COM2_Rx, COM2_Tx, COM3_Rx, COM3_Tx, EVENT, SAT_LED, RESETIN

4. VCC

Main power supply, voltage range is 3.3VDC~5.5V DC. Voltage ripple and spike requirements: <100mV.

主供电电源(输入), 电压范围: 3.3V~5.5V(直流)。电压纹波和尖峰脉冲要求: <100mV。

5. RESETIN

Low active, it can be used to reset the whole OEM board, which is 3.3V compatible.

低电平有效, 可用于复位整个OEM板。

6. RTK_LED / SAT_LED

SAT_LED is used to indicate the satellite number. RTK_LED indicates that RTK is undergoing. Both RTK_LED and SAT_LED are all high active. External LED driver is needed for normal use.

RTK_LED闪烁指示接收到基准站的数据, SAT_LED指示卫星数量, 一次连续闪烁的次数表示当前搜到卫星的数量。RTK_LED与SAT_LED均为高电平驱动LED, 需要外加LED驱动。

V. APPLICATION CONNECTION EXAMPLE / 应用连接示例

In this section, an application connection example of K700 OEM board is presented via specific schematic diagrams. Per the instruction of these diagrams, you could easily build the communication circuits between K700 OEM board 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 K700 板卡应用连接示例。参照下面的图示，您可以很方便建立 K700 板卡和其他终端（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。

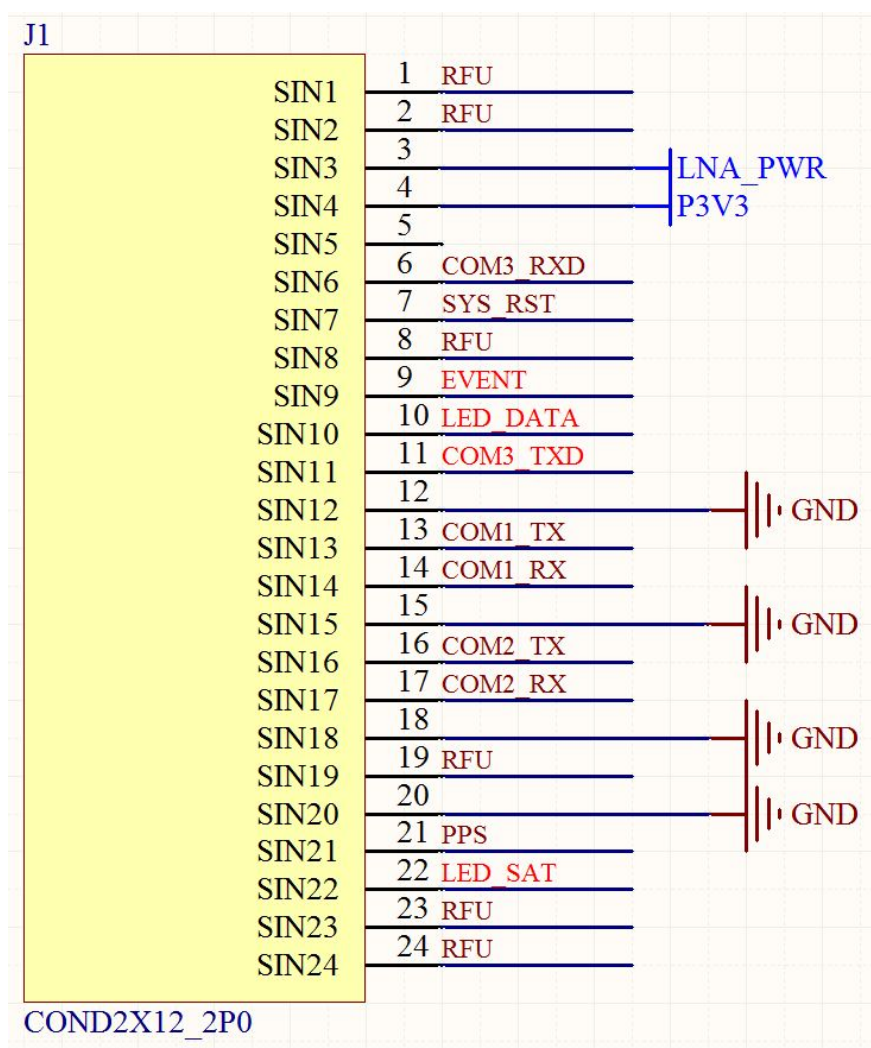


Figure 2. K700 Pin Assignment Schematic

(K700 引脚分配及外接电路示意)

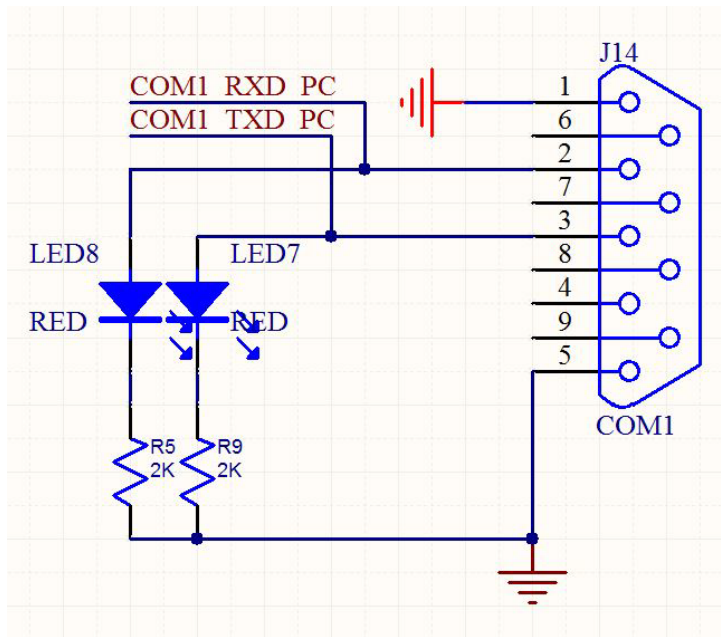


Figure 3. Connection of RS232 COM1 Connector to PC

(K700 RS232 COM1 电平转换之后与电脑连接的接头)

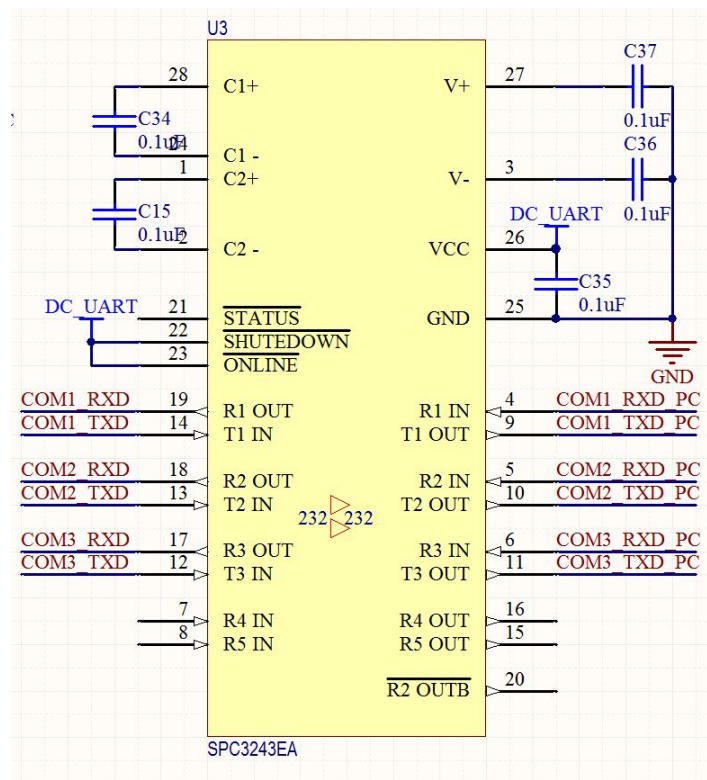


Figure 4. Connections between RS232 COM 1, 2, 3 of K700 and some other Devices with an UART

(K700 RS232 COM1/2/3 与其他使用 UART 接口的设备之间的连接示意)