



# PRODUCT SPECIFICATION

## 产品规范

适用于 For  
K803D GNSS 模块  
K803D GNSS Module



### INTRODUCTION

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REVISION HISTORY / 修订历史

| Revision/版本 | Modification/更改                                      | Date/日期    |
|-------------|------------------------------------------------------|------------|
| 1.0         | New Release / 新发                                     | 2023/08/29 |
| 1.1         | Modify the physical picture / 修改实物图                  | 2024/08/08 |
| 1.2         | change the packing method / 更换包装方式                   | 2024/08/30 |
| 1.3         | Modify the soldering temperature of SMT / 修改SMT的焊接温度 | 2025/12/23 |

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# 1. Introduction / 简介

K803D GNSS is a full system full frequency RTK positioning module that supports signal tracking for satellite systems such as BDS-2, BDS-3, GPSGLONASS, Galileo, QZSS, NavIC, etc. It is an onboard IMU that supports tilt measurement and is suitable for fields such as surveying and mapping.

K803D GNSS 是全系统全频点 RTK 定位模块，支持 BDS-2、BDS-3、GPSGLONASS、Galileo、QZSS、IRNSS 等卫星系统信号跟踪，板载IMU，支持倾斜测量，适用于测量测绘等领域。

## 1.1. Product Characteristics / 产品特性

Table 1. Product Characteristics / 产品特性

| Characteristics                 | K803D                                                                |                                                            |
|---------------------------------|----------------------------------------------------------------------|------------------------------------------------------------|
| Signals<br><br>信号               | Positioning<br><br>定位                                                | GPS: L1C/A, L2P, L2C, L5, L1C                              |
|                                 |                                                                      | BDS-2: B1I, B2I, B3I<br><br>BDS-3: B1I, B3I, B1C, B2a, B2b |
|                                 |                                                                      | GLONASS: G1, G2, G3*                                       |
|                                 |                                                                      | Galileo: E1, E5b, E5a, E5 AltBoC*, E6c*                    |
|                                 |                                                                      | QZSS*: L1C/A, L2C, L5, L1C                                 |
|                                 |                                                                      | SBAS*: L1C/A, L5                                           |
|                                 |                                                                      | NavIC*: L5                                                 |
|                                 | Items with * will be adjusted with the version.<br><br>带*项会随同版本进行调整。 |                                                            |
| Time to First Fix<br><br>首次定位时间 | Cold Start<br><br>冷启动                                                | <20s (Adding Acceleration Capture Module,增加捕获加速模块)         |
|                                 | Hot Start (with RTC)<br><br>热启动 (使用RTC)                              | <10s (Typical,典型)                                          |
| Signal Capture                  | Reacquisition                                                        | <1s                                                        |

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|                                |                                                                                  |                                                                                                                         |
|--------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 信号捕获                           | 失锁重捕                                                                             |                                                                                                                         |
|                                | Signals Tracking Sensitivity<br>信号跟踪灵敏度                                          | -155dBm                                                                                                                 |
|                                | Signal Capture Sensitivity<br>信号捕获灵敏度                                            | -138dBm                                                                                                                 |
| Measurement Precision<br>测量准确度 | Pseudo-range Precision<br>伪距精度                                                   | ≤10cm                                                                                                                   |
|                                | Carrier Phase Precision<br>载波相位精度                                                | ≤1mm                                                                                                                    |
| Accuracy<br>精度                 | PPS (RMS)<br>授时精度                                                                | 20ns                                                                                                                    |
|                                | SPP Accuracy<br>标准单点定位精度                                                         | H≤1.5m, V≤3m (1σ, PDOP≤4)                                                                                               |
|                                | Static Differential Accuracy<br>(Supported by Compass Solution)<br>静态差分精度 (软件支持) | H:±(2.5+1×10 <sup>-6</sup> ×D)mm<br>V:±(5.0+1×10 <sup>-6</sup> ×D)mm<br>D为基线长度 (单位: mm)<br>D-Baseline length (Unit: mm) |
|                                | Speed Accuracy<br>测速精度                                                           | ≤0.02m/s (1σ, PDOP≤4)                                                                                                   |
|                                | angular range<br>倾斜测量角度范围                                                        | ±60°                                                                                                                    |
|                                | measurement accuracy<br>倾斜测量精度                                                   | < 2.5cm                                                                                                                 |
| PPP                            | PPP Convergence Time                                                             | <15min                                                                                                                  |

|                          |                                                                                                      |                                                                                                                 |
|--------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                          | PPP初始化时间                                                                                             |                                                                                                                 |
|                          | PPP Accuracy<br>PPP精度                                                                                | H≤10cm, V≤20cm                                                                                                  |
| RTK                      | RTK Initialization Time<br>RTK初始化时间                                                                  | <5s (D<10km)                                                                                                    |
|                          | Initialization Reliability<br>初始化置信度                                                                 | >99.9%                                                                                                          |
|                          | RTK Accuracy<br>RTK精度                                                                                | H:±(8+10 <sup>-6</sup> ×D)mm<br>V:±(15+10 <sup>-6</sup> ×D)mm<br>D为基线长度(单位: mm)<br>D-Baseline length (Unit: mm) |
| Anti-interference<br>抗干扰 | K803D is built-in narrowband and continuous wave suppression algorithm engine<br>K803D内置窄带和连续波抑制算法引擎 |                                                                                                                 |
| IMU                      | Gyroscope<br>陀螺仪                                                                                     | Measurement ranges<br>量程: ±1000°/s                                                                              |
|                          |                                                                                                      | Zero-biased stability<br>零偏稳定性: 5°/h                                                                            |
|                          |                                                                                                      | Angular random walk<br>角度随机游走: 0.12°/sqrt(h)                                                                    |
|                          | Accelerometer<br>加速度计                                                                                | Measurement ranges<br>量程: ±8g                                                                                   |
|                          |                                                                                                      | Bias instability<br>零偏稳定性: 50ug                                                                                 |
|                          |                                                                                                      | Velocity random walk                                                                                            |

|                        |                                  |                                                                                                         |
|------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------|
|                        |                                  | 速度随机游走: 0.07m/s/sqrt(h)                                                                                 |
| Data Rates<br>数据速率     | Measurements & Position<br>测量&定位 | Max 20Hz                                                                                                |
|                        | RTK: Positioning<br>RTK: 定位      | Max 20Hz                                                                                                |
|                        | IMU                              | Max 50Hz                                                                                                |
| Data Formats<br>输出数据格式 | NMEA-0183                        | GPGLL, GPGSV, GPGGA, GPRMC, GPVTG, GPZDA etc.                                                           |
|                        | ComNav Binary (CNB)<br>司南二进制格式   | ComNav Self-Defined Binary<br>司南自定义二进制                                                                  |
|                        | CMR(GPS)                         | CMROBS, CMRREF                                                                                          |
|                        | RTCM2.X                          | RTCM1, RTCM3, RTCM31                                                                                    |
|                        | RTCM3.X                          | 1004~1008,1012,1019,1020,1033,1042,1045/1046, 1230<br>MSM3~MSM7:1073~1077,1083~1087,1123~1127,1093~1097 |
| Electrical<br>电气特性     | Voltage<br>供电电压                  | + 3.3V~3.45V DC                                                                                         |
|                        | Power Consumption<br>功耗          | 0.95W                                                                                                   |
| Environmental<br>环境要求  | Operating Temperature<br>工作温度    | -40°C~+85°C                                                                                             |
|                        | Storage Temperature<br>储存温度      | -55°C~+95°C                                                                                             |

|                            |                            |                                              |
|----------------------------|----------------------------|----------------------------------------------|
| Antenna Interface<br>天线接口  | Impedance Matching<br>阻抗匹配 | 50Ω                                          |
|                            | Antenna Power<br>天线供电电压    | External 外部供电:<br><br>+3.3V~+5V @ (0-100) mA |
|                            | Antenna Gain<br>天线增益       | 20~35dB                                      |
| Hardware Interface<br>硬件接口 |                            | UARTx4, PPSx1, EVENTx2, SPIx1                |
| Physical<br>物理参数           | Size<br>尺寸                 | 30mm×30mm×3.2mm                              |
|                            | Weight<br>重量               | 6.6g                                         |
|                            | Flatness<br>平整度            | ≤0.1mm                                       |
|                            | Package<br>封装              | LGA (82PIN)                                  |

## 2. Size / 尺寸

In this section, product photo, three-side views and the dimension of K803D is provided for customers' further hardware design and installation.

本节提供了K803D的实物图，三视图和对应的物理尺寸，便于用户进一步系统硬件设计和安装。



Figure 1. K803D Product Photo / K803D 实物图

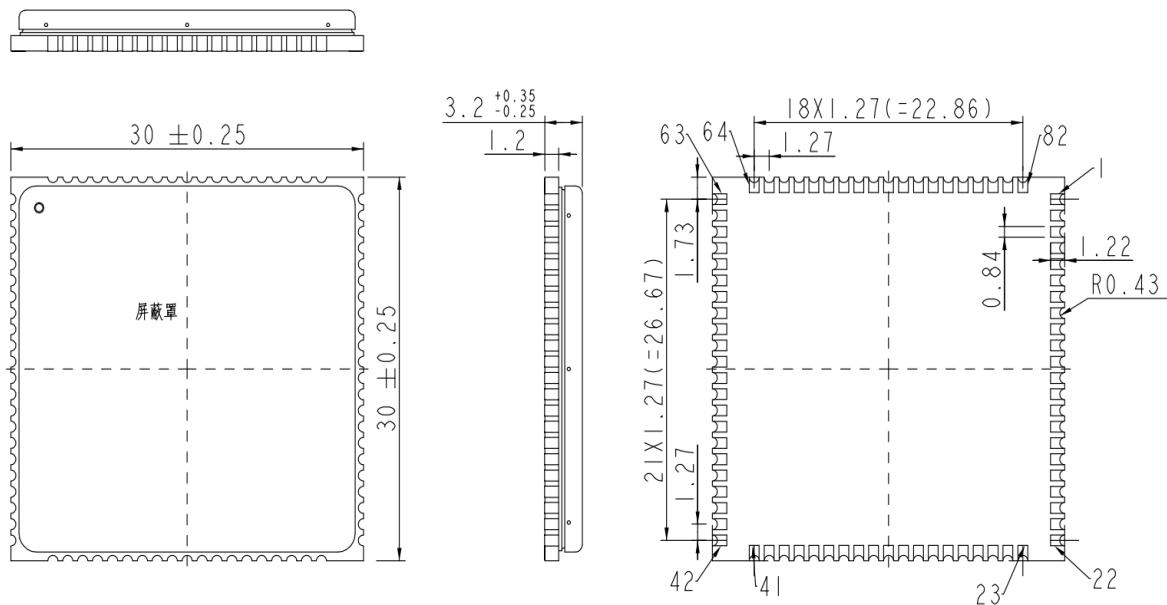


Figure 2. K803D Dimension View / K803D 三视图

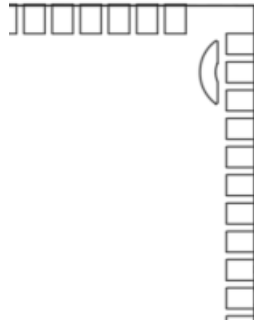


Figure 3. K803D Bottom Section View / K803D 底部部分视图

Note: Because there is a half-moon window exposed tin position near the bottom of K803D module 62Pin, it is recommended that the pad should not be expanded outward when the user is packaged, otherwise it will be short-circuited.

注意：因为K803D模块62Pin附近底部有半月形开窗露锡位置，建议用户封装时，焊盘尽量不要往外扩，否则会短路。

### 3. Pin Arrangement and Definition / 针脚标识与定义

K803D is surface-mount OEM Module which integrates 82 Pin (pitch 1.27mm).

K803D包括82Pin，表贴式模块（pitch 1.27mm）。

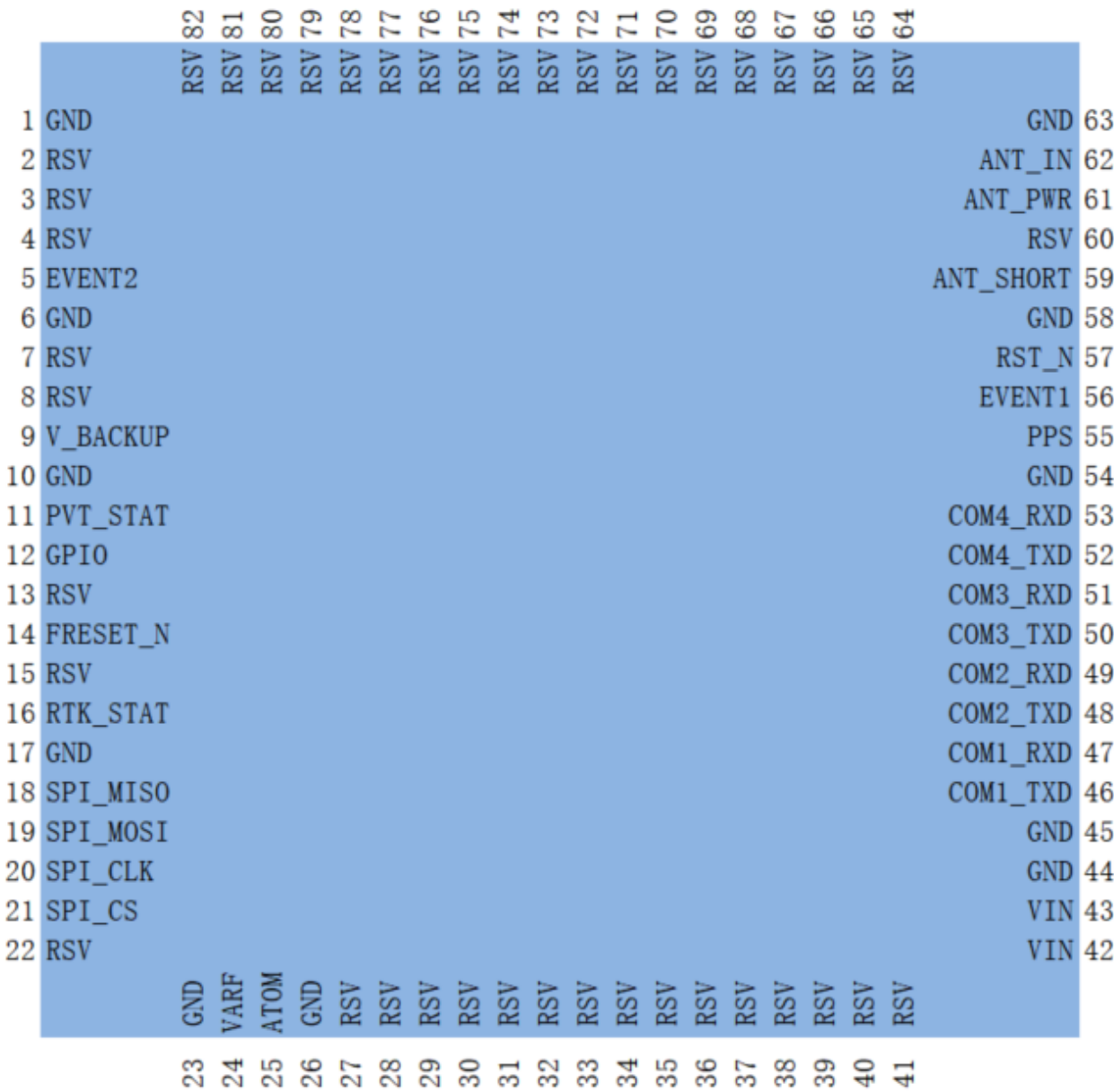


Figure 4. K803D Includes 82-Pin Pad / K803D 包括82连接焊盘

Table 2. Pin Definition of K803D 82-Pin Pad / K803D 82针脚焊盘的针脚定义

| Pin | Signal | Type | Description      |     |
|-----|--------|------|------------------|-----|
| 1   | GND    | GND  | Ground Reference | 参考地 |

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| Pin   | Signal   | Type | Description                           |                                   |
|-------|----------|------|---------------------------------------|-----------------------------------|
| 2~4   | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 5     | EVENT2   | I    | Event Mark                            | 外部事件输入                            |
| 6     | GND      | GND  | Ground Reference                      | 参考地                               |
| 7~8   | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 9     | V_BACKUP | PWR  | Power Supply for Internal RTC         | 外接RTC电池                           |
| 10    | GND      | GND  | Ground Reference                      | 参考地                               |
| 11    | PVT_STAT | O    | PVT Status                            | 搜星时，模块搜星数与高电平脉冲数一致；不搜星时，5S输出一次高电平 |
| 12    | GPIO     | I/O  | General-Purpose Input/Output          | 通用IO                              |
| 13    | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 14    | FRESET_N | I    | Reset to Factory Mode (Active Low)    | 复位为出厂模式（低电平有效）                    |
| 15    | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 16    | RTK_STAT | O    | RTK Data LED Indicator                | 在接收或发送差分信号时会输出高电平脉冲，其他状态输出低电平     |
| 17    | GND      | GND  | Ground Reference                      | 参考地                               |
| 18    | SPI_MISO | I    | SPI_MISO                              | SPI主输入从输出信号                       |
| 19    | SPI_MOSI | O    | SPI_MOSI                              | SPI主输出从输入信号                       |
| 20    | SPI_CLK  | O    | SPI_CLK                               | SPI总线时钟信号                         |
| 21    | SPI_CS   | O    | SPI_CS                                | SPI总线片选信号                         |
| 22    | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 23    | GND      | GND  | Ground Reference                      | 参考地                               |
| 24    | VARF     | O    | Square Wave Output                    | 方波输出                              |
| 25    | ATOM*    | I    | Atomic Clock Input                    | 原子钟输入                             |
| 26    | GND      | GND  | Ground Reference                      | 参考地                               |
| 27~41 | RSV      | /    | Reserve (Float)                       | 保留管脚（悬空）                          |
| 42~43 | VIN      | PWR  | DC Power Supply for Module (3.3V)     | 模块供电电源（+3.3V）                     |
| 44~45 | GND      | GND  | Ground Reference                      | 参考地                               |
| 46    | COM1_TXD | O    | Transmitted Data for COM1 Output      | 串口1输出信号                           |
| 47    | COM1_RXD | I    | Received Data for COM1 Input          | 串口1输入信号                           |
| 48    | COM2_TXD | O    | Transmitted Data for COM2 Output      | 串口2输出信号                           |
| 49    | COM2_RXD | I    | Received Data for COM2 Input          | 串口2输入信号                           |
| 50    | COM3_TXD | O    | Transmitted Data for COM3 Output      | 串口3输出信号                           |
| 51    | COM3_RXD | I    | Received Data for COM3 Input          | 串口3输入信号                           |
| 52    | COM4_TXD | O    | Transmitted Data for COM4 Output      | 串口4输出信号                           |
| 53    | COM4_RXD | I    | Received Data for COM4 Input          | 串口4输入信号                           |
| 54    | GND      | GND  | Ground Reference                      | 参考地                               |
| 55    | PPS      | O    | Pulse Output Synchronized to OEM Time | 同步卫星时间脉冲                          |

| Pin                                                              | Signal    | Type    | Description                                                  |                     |
|------------------------------------------------------------------|-----------|---------|--------------------------------------------------------------|---------------------|
| 56                                                               | EVENT1    | I       | Event Mark                                                   | 外部事件输入              |
| 57                                                               | RST_N     | I       | Quick Reset without Clearing User Configuration (Low Active) | 快速复位，不清除用户配置（低电平有效） |
| 58                                                               | GND       | PWR     | Ground Reference                                             | 参考地                 |
| 59                                                               | ANT_SHORT | O       | Short Indication of Antenna (Low Active)                     | 天线短路指示(低电平有效)       |
| 60                                                               | RSV       | /       | Reserve (Float)                                              | 保留管脚（悬空）            |
| 61                                                               | ANT_PWR   | PWR (I) | Power Supply for External GNSS Antenna LNA                   | 外部GNSS天线供电          |
| 62                                                               | ANT_IN    | I       | GNSS Antenna                                                 | GNSS天线输入            |
| 63                                                               | GND       | GND     | Ground Reference                                             | 参考地                 |
| 64~82                                                            | RSV       | /       | Reserve (Float)                                              | 保留管脚（悬空）            |
| Items with * will be adjusted with the version.<br>带*项会随同版本进行调整。 |           |         |                                                              |                     |

3.1. Remarks / 说明

1. Electrical Characteristics / 电气特性

COM1/2/3/4(TX&RX), SPI, ANT\_SHORT, PVT\_STAT, FRESET\_N, RTK\_STAT, RST\_N, PPS EVENT1 and EVENT2 are LVCMOS 3.3V level, All these signals are LVCMOS/LVTTL 3.3V compatible.

COM1/2/3/4 (TX&RX) , SPI, ANT\_SHORT, PVT\_STAT, FRESET\_N, RTK\_STAT, PGMEN, RST\_N, PPS, EVENT1和EVENT2为LVCMOS 3.3V 电平，所有这些信号均兼容LVCMOS / LVTTL 3.3V。

Table 3. LVCMOS 3.3V Electrical Standard / LVCMOS 3.3V电气标准

| Symbols 符号      | Description 描述                       | Min 最小   | Max 最大   |
|-----------------|--------------------------------------|----------|----------|
| V <sub>IH</sub> | Input high voltage<br>输入高电压          | 2.0V     | VCC+0.3V |
| V <sub>IL</sub> | Input low voltage<br>输入低电压           | -0.3V    | 0.8V     |
| V <sub>OH</sub> | High-level output voltage<br>高电平输出电压 | VCC-0.4V | --       |
| V <sub>OL</sub> | Low-level output voltage<br>低电平输出电压  | --       | 0.41V    |
| I <sub>OH</sub> | Sourcing current<br>拉电流              |          | 8mA      |
| I <sub>OL</sub> | Sinking current<br>灌电流               |          | 8mA      |

Table 4. LVTTTL 3.3V Electrical Standard / LVTTTL 3.3V电气标准

| Symbols 符号 | Description 描述                       | Min 最小        | Max 最大        |
|------------|--------------------------------------|---------------|---------------|
| $V_{IH}$   | Input high voltage<br>输入高电压          | 2.0V          | $V_{CC}+0.3V$ |
| $V_{IL}$   | Input low voltage<br>输入低电压           | -0.3V         | 0.8V          |
| $V_{OH}$   | High-level output voltage<br>高电平输出电压 | $V_{CC}-0.4V$ | --            |
| $V_{OL}$   | Low-level output voltage<br>低电平输出电压  | --            | 0.41V         |
| $I_{OH}$   | Sourcing current<br>拉电流              |               | 8mA           |
| $I_{OL}$   | Sinking current<br>灌电流               |               | 8mA           |

## 2. Can withstand Voltage Range / 能承受的电压范围

The signal with the maximum voltage range from -0.3V to 3.6V is as follows: COM1/2/3/4 (TX&RX), SPI, ANT\_SHORT, JTAG, PVT\_STAT, FRESET\_N, RTK\_STAT, PGMEN, RST\_N, PPS, EVENT1 and EVENT2.

所能承受电压的最大值范围是-0.3V~3.6V的信号如下：COM1/2/3/4（TX&RX），SPI，ANT\_SHORT，JTAG，PVT\_STAT，FRESET\_N，RTK\_STAT，PGMEN，RST\_N，PPS，EVENT1和EVENT2。

## 3. Supply Voltage / 供电电压

VIN main power supply, voltage range: 3.3V~3.45V (DC), voltage ripple and spikes require less than 50mV. K803D: ANT\_PWR, voltage range: 3.3V ~ 5.5V (DC), voltage ripple and spikes require less than 50mV. V\_BACKUP operating voltage 1.8V~3.6V, voltage ripple and spike pulse requirements are less than 30mV; When charging the Farrah capacitor, V\_BACKUP voltage reference circuit, voltage ripple and spike pulse requirements are less than 30mV.

VIN主供电电源，电压范围：3.3V~3.45V（直流），电压纹波和尖峰脉冲要求小于50mV。K803D：ANT\_PWR，电压范围：3.3V~5.5V（直流），电压纹波和尖峰脉冲要求小于50mV。V\_BACKUP工作电压1.8V~3.6V，电压纹波和尖峰脉冲要求小于30mV；给法拉电容充电时，V\_BACKUP电压参考电路，电压纹波和尖峰脉冲要求小于30mV。

## 4. Add Surge Protection / 增加浪涌保护

In order to effectively protect against lightning strikes and surges, and prevent damage to the feed current limiting chip inside the module, it is recommended that users supply power to the antenna from outside the module and increase the surge protection function.

If you need to feed the antenna from the outside, it is recommended to use a high-voltage, high-power feeder chip; or add high-power protection devices such as gas discharge tubes, varistors, and TVS tubes to the feeder circuit.

为了有效防雷击、防浪涌，防止模块内部的馈电限流芯片损坏,建议用户从模块外部给天线供电并增加浪涌保护功能。

如需从外部为天线馈电，建议选用高耐压、大功率的馈电芯片；或在馈电电路上增设气体放电管、压敏电阻、TVS管等大功率的防护器件。

## 5. Antenna Short Circuit Description / 电线短路说明

When using the internal feed of the board, the following situations will occur:

- 1) When the antenna is normal, Pin 59 outputs high level;
- 2) When the antenna is short circuited, Pin 59 outputs low level

当使用板卡内部馈电时，会出现如下情况：

- 1) 天线正常时，Pin 59输出高电平；
- 2) 天线短路时，Pin 59输出低电平；

## 6. Hardware Integration Considerations / 硬件集成注意事项

- 1) VCC power-on has a good monotonicity, and the initial level is lower than 0.4V, and the upstroke and ringing are guaranteed within the range of 5% VCC;
- 2) Use the VCC pin to provide a reliable power supply and all GND pins of the module are grounded;
- 3) Connect the ANT\_IN signal to the antenna, pay attention to the 50Ω impedance matching of the line;
- 4) The ANT\_PWR pin is connected to +3.3~5.5V voltage, and then provides +3.3~5.5V feed to the antenna through the ANT\_IN pin;
- 5) The module reset pin FRESET\_N is for restoring the factory settings of the module, and RST\_N is for quick reset. Please connect it correctly to ensure that the module can be reset reliably;
- 6) Special attention should be paid to:

Power supply: The guarantee of stable and low ripple power supply, the peak-to-peak value of the ripple voltage is preferably not higher than 50mVpp. It is recommended to use a power chip with a current output capacity greater than 2A to supply power to the module.

In addition to using LDO to ensure the power supply is pure, it is also necessary to consider:

- ①. Widening the power traces or using split copper surfaces to transmit current;
  - ②. Place the LDO as close to the module as possible in the layout;
  - ③. Avoid the power traces passing through high power with high inductance devices such as magnetic coils.
- 7) Antenna interface: The antenna line is as short and smooth as possible, avoiding acute angles; pay attention to 50Ω impedance matching;

- 8) Avoid wiring directly under K803D;
  - 9) The module is as far away from the high temperature airflow as possible.
- 1) VCC上电具有良好的单调性，且起始电平低于0.4V，上冲与振铃保障在5%VCC范围内；
  - 2) 用VCC引脚提供可靠的电源且模块所有GND引脚接地；
  - 3) 连接ANT\_IN信号至天线,注意线路50Ω阻抗匹配；
  - 4) ANT\_PWR脚接入+3.3~5.5V电压，再经由ANT\_IN脚对天线提供+3.3~5.5V的馈电；
  - 5) 模块复位引脚FRESET\_N为恢复模块出厂设置，RST\_N为快速复位，请正确连接以保证模块可以可靠复位；
  - 6) 在设计中应特别注意：  
供电：稳定及低纹波电源的保证，纹波电压峰峰值最好不高于50mVpp。建议采用电流输出能力大于2A的电源芯片给模块供电。  
除了可采用LDO保证供电纯净外，还需要考虑：
    - ①. 加宽电源走线或采用分割铺铜面来传输电流；
    - ②. 布局上尽量将LDO靠近模块放置；
    - ③. 电源走线避免经过大功率与高感抗器件如磁性线圈。
  - 7) 天线接口：天线线路尽量短且顺畅，避免走锐角；注意50Ω阻抗匹配；
  - 8) 避免在K803D正下方走线；
  - 9) 模块尽量远离高温气流。

## 7. Static Electricity Protection / 静电保护

Some components on K803D module are easily damaged by static electricity, which in turn affects the IC circuit and other components. Therefore, you should pay attention to electrostatic protection measures when using it.

- 1) When handling the module, try to wear gloves or finger cots and an anti-static wrist strap that meets the electrostatic protection standards;
- 2) During the process of taking the module, only the edge of the board should be taken, and the solder joints, circuit parts or components should not be directly touched to avoid sweat fingerprints from contaminating the solder joints;
- 3) The module should be protected by a soft protective pad between the module and the module interval during transportation;
- 4) When the module is idle, it should be placed on a soft protective pad (such as anti-static sponge pad, etc.), and do not stack at will;
- 5) The modules should be placed neatly and orderly, with a certain interval between modules to avoid collision with each other;
- 6) The module should be handled with care during use to prevent the module from being damaged by rough operation;
- 7) When powering on, pay attention to the positive and negative poles of the power supply and the voltage to avoid reverse connection and excessive voltage from burning the module;
- 8) When soldering the module to the motherboard, please ensure that the GND is soldered first, and then the ANT\_IN pin;
- 9) When handling ANT\_IN pin, do not touch any live capacitance or material (e.g., surface mount antenna, coaxial cable, wire iron, etc.) to avoid damage to the ANT\_IN pin by the charge generated or stored by said capacitor or material;

10) Please make sure to solder the ANT\_IN pin with an electrical protection iron.

K803D模块上的部分元器件易受静电影响而损坏，进而影响IC电路及其他元件。因此在使用时应注意做好静电保护措施。

- 1) 拿取模块时应尽量戴好手套或者指套以及符合静电防护标准的防静电腕带；
- 2) 模块拿取过程中应只拿取板卡的边缘部位，不能直接接触焊点，线路部分或者元器件，避免汗液指印污染焊点；
- 3) 模块在运输过程中模块与模块间隔之间应该采用软性防护垫进行保护；
- 4) 模块闲置时应放置在软性防护垫上（如防静电海绵垫等），不要随意堆叠；
- 5) 模块摆放应摆放整齐有序，模块之间保持一定间隔，避免相互碰撞；
- 6) 模块在使用过程中应该轻拿轻放，防止粗暴作业损坏模块；
- 7) 上电时，注意电源正负极以及电压，避免反接和电压过高烧毁模块；
- 8) 将模块焊接到主板时，请确保GND先焊接，然后再焊接ANT\_IN引脚；
- 9) 处理ANT\_IN引脚时，请不要接触任何带电电容或材料（例如表贴天线、同轴电缆、电烙铁等），以免所述电容或材料所产生或存储的电荷损坏ANT\_IN引脚；
- 10) 请确保使用带电保护的电烙铁焊接ANT\_IN引脚。

## 4. Assembling & Repairing Note / 装配及维修说明

### 4.1. Module Assembling Note / 模块装配说明

K803D is surface mounted, SMT welding is recommended for assembly.

K803D为表贴式模块，推荐使用SMT的焊接方式进行装配。

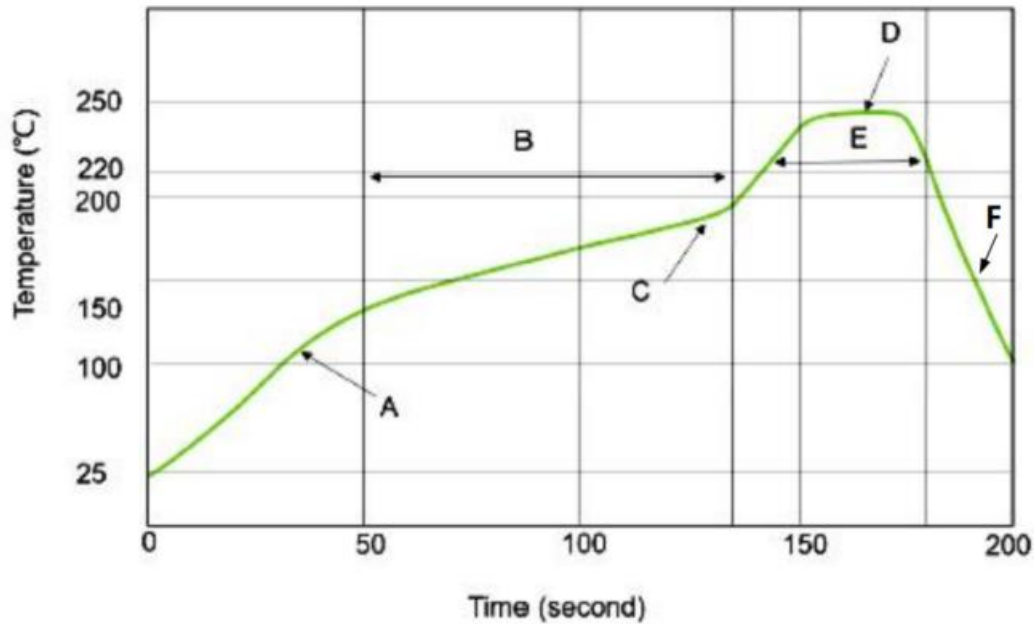


Figure 5. Furnace Temperature Curve / 炉温曲线

The process temperature limits are as follows:

- A: Heating Zone: Rising Slope:  $1 \sim 3^{\circ}\text{C} / \text{sec}$
- B: Constant Temperature Zone: Range:  $150 \sim 190^{\circ}\text{C}$  Time:  $80 \sim 110 \text{ S}$
- C: Constant Temperature→Reflow Zone: Rising Slope:  $1 \sim 3^{\circ}\text{C} / \text{sec}$
- D: Peak Temperature:  $235 \sim 240^{\circ}\text{C}$
- E: Reflow Zone: Range: Over  $220^{\circ}\text{C}$  Time:  $50 \sim 80 \text{ S}$
- F: Descent Slope:  $-5^{\circ}\text{C} \sim -1^{\circ}\text{C} / \text{sec}$

制程温度界限如下：

- A: 升温区：斜率： $1 \sim 3^{\circ}\text{C} / \text{sec}$
- B: 恒温区： $150 \sim 190^{\circ}\text{C}$  时间： $80 \sim 110\text{S}$
- C: 恒温→回流区：斜率： $1 \sim 3^{\circ}\text{C} / \text{sec}$
- D: 峰值温度： $235 \sim 240^{\circ}\text{C}$
- E: 回流区：大于  $220^{\circ}\text{C}$  时间： $50 \sim 80\text{S}$
- F: 下降斜率： $-5 \sim -1^{\circ}\text{C} / \text{sec}$

In order to prevent the module from being damaged by repeated heating, it is recommended to place the module after finishing the first side of PCB board. SMT soldering must be carried out strictly in accordance with the above-mentioned temperature range. The peak temperature must not be exceeded, and a hot air gun must not be used for soldering. Otherwise, any losses caused will be borne by the individual.

为避免模块因反复受热而损坏，建议在完成PCB板第一面的回流焊之后再贴模块。需严格按照上述温度范围进行SMT焊接，不得超过峰值温度，不得用热风枪进行焊接，否则造成的损失需自行承担。

## 4.2. Repairing Note / 维修说明

When disassembling the module, it is suggested using a BGA welding bench. Please use correct air tuyere and choose certain temperature curve. Keep peak temperature under 240°C, rising slope under 3°C/s.

拆卸模块时，请使用BGA返修台，选择适合尺寸的风嘴并使用合适的温度曲线，最高温度不超过240°C，升温斜率不超过3°C/s。

## 5. Application Connection Example / 应用连接示例

In this section, an application connection example of K803D OEM Module is presented via specific schematic diagrams. Per the instruction of these diagrams, you could easily build the communication circuits between K803D OEM 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K803D模块应用连接示例。参照下面的图示，您可以很方便建立K803D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。

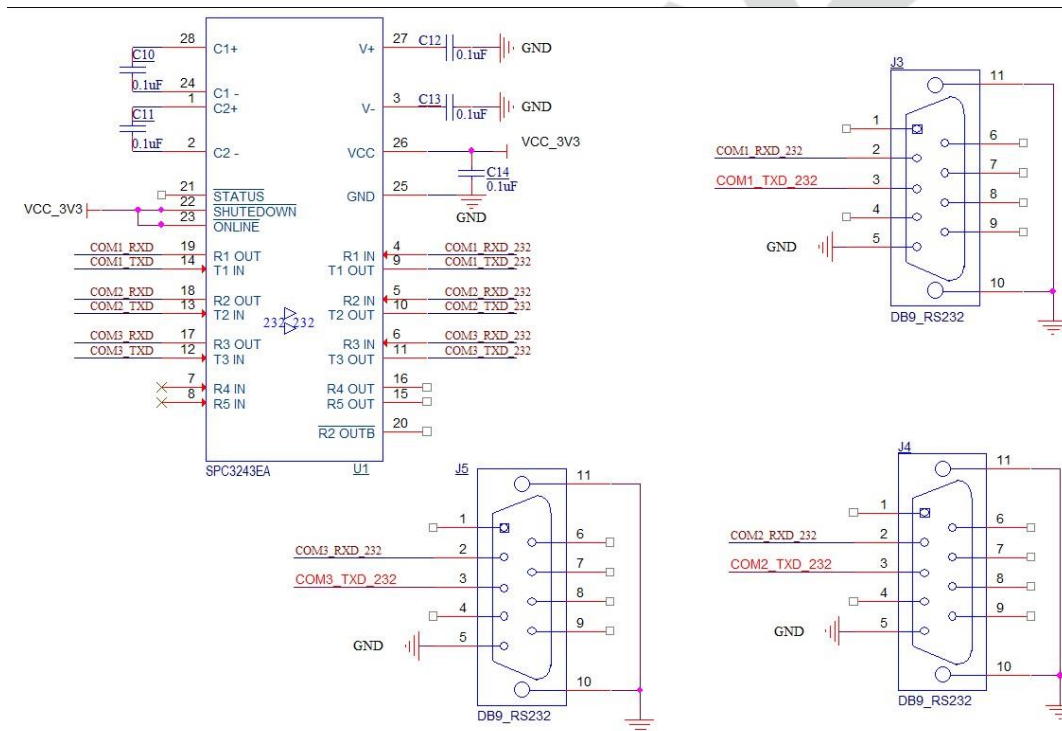


Figure 6. Connections between RS232 COM1, 2, 3 of K803D and Some Other Devices with An UART / K803D RS232 COM1、2、3 与其他使用UART接口的设备之间的连接示意

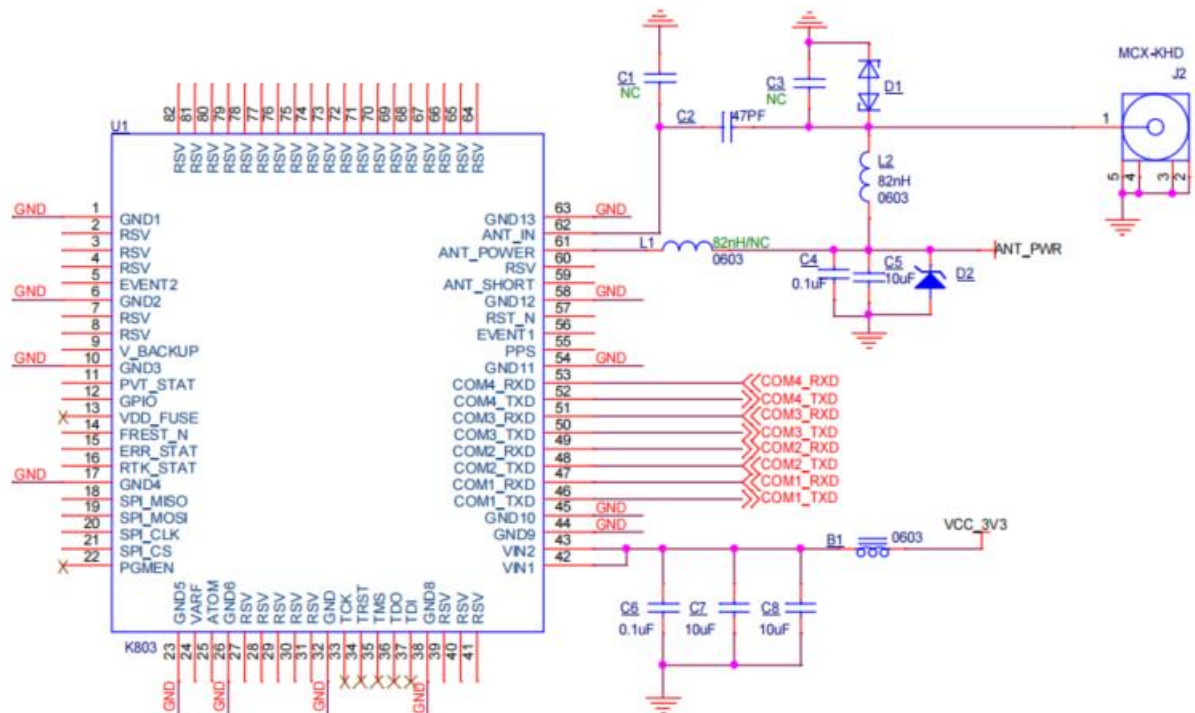


Figure 7. Minimum Hardware Design of K803D / K803D 最小硬件设计

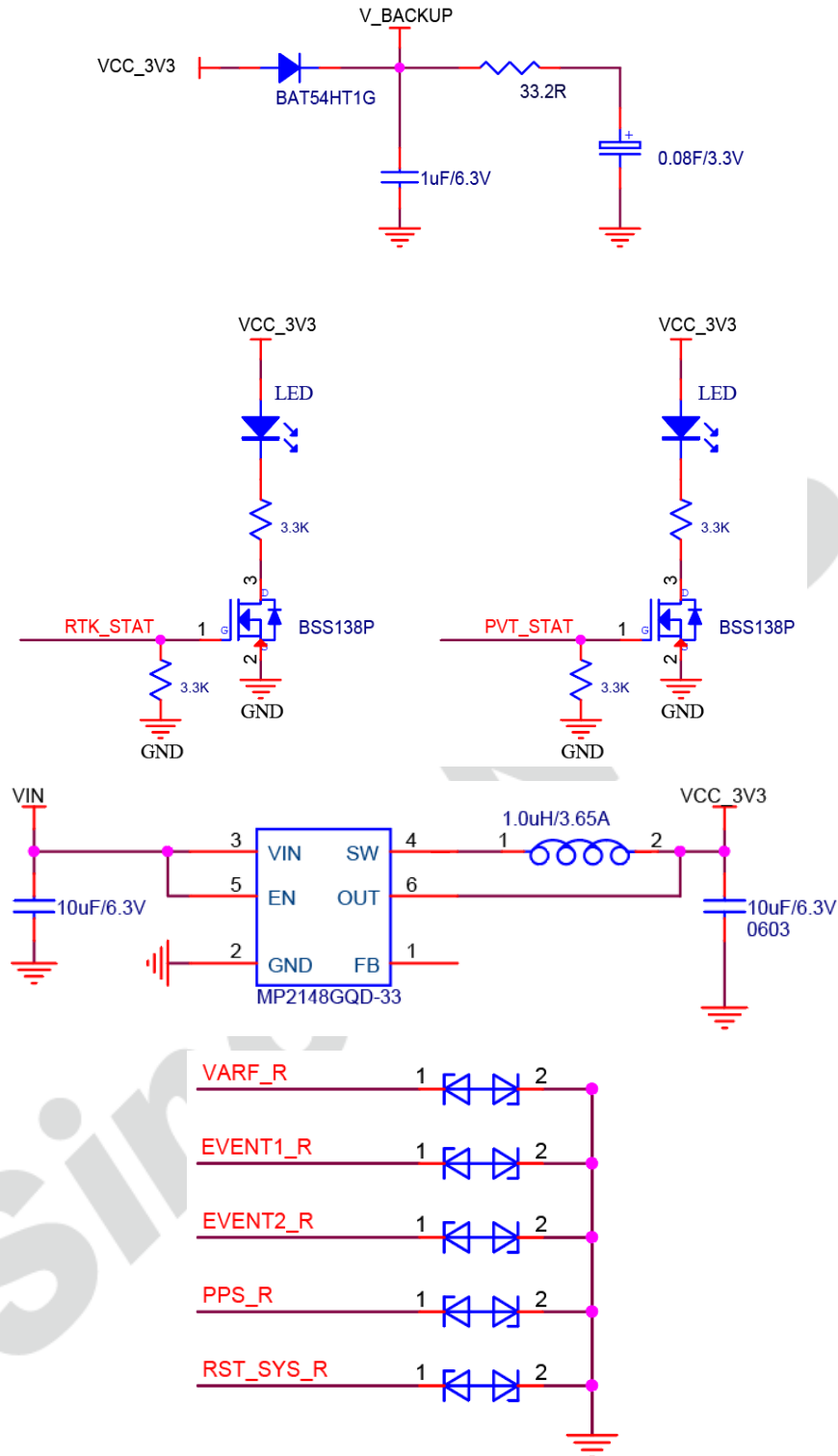


Figure 8. Recommend Design of K803D / K803D 推荐硬件设计

6. Package / 包装

K803D module is packaged in a vacuum-sealed aluminum foil electrostatic bag containing desiccant and moisture proof by means of carrier tape and coil (applicable to mainstream surface mount equipment). When welding modules by reflow soldering process, please strictly comply with IPC standards for humidity control of modules. Because the packing materials such as the carrier belt can only withstand 55°C, the modules need to be removed from the packaging during baking operation.

K803D 模块使用载带、卷盘方式（适用于主流表面贴装设备），包装在真空密封的铝箔防静电袋中，内含干燥剂防潮。采用回流焊工艺焊接模块时，请严格遵守 IPC 标准对模块进行湿度管控。由于载带等包装材料只能承受 55°C，在进行烘烤作业时需要将模块从包装中取出。

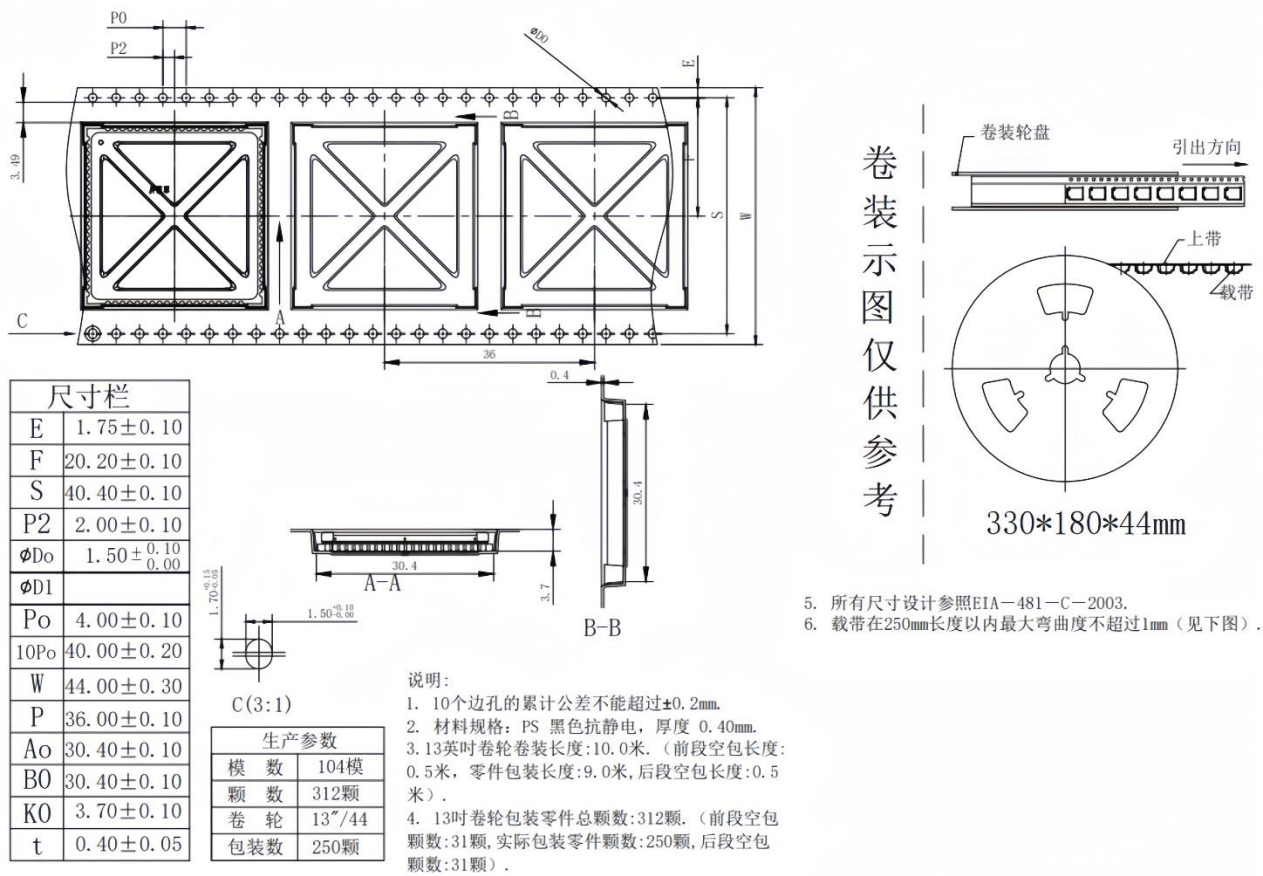


Figure 9. K803D Roll Tape Packing / K803D 卷带包装

Table 5. K803D Package Description / K803D 包装说明

| Project           | Description    |
|-------------------|----------------|
| Number of Modules | 250 Slice/Roll |
| 模块数量              | 250 片/卷        |

|                        |                                                                                                                           |
|------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Reel Size<br><br>卷盘尺寸  | Material tray:13 inches<br><br>料盘：13 寸                                                                                    |
|                        | Outer diameter: 330mm, inner diameter: 180mm, width: 44mm, wall thickness: 3.7mm<br><br>外径 330mm，内径 180mm，宽 44mm，壁厚 3.7mm |
|                        | Package of each module: length 30.4mm, width 30.4mm<br><br>每个模块包装：长 30.4mm，宽 30.4mm                                       |
| Carrier Belt<br><br>载带 | Module Spacing (Center Distance): 36mm<br><br>模块间距（中心距）：36mm                                                              |

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