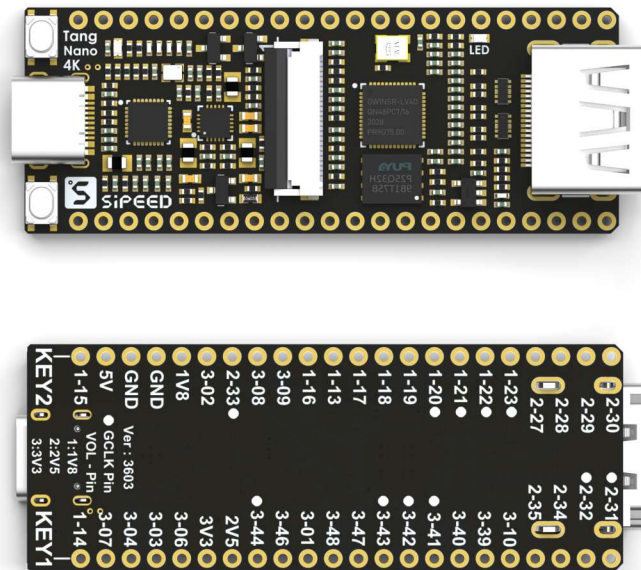# Sipeed Tang Nano 4K Datasheet v1.0

## Characteristic:

- Main Chip : GW1NSR-LV4C with arm Cortex-M3 hard core
- Embedded FPGA logic module unit (4608 lut4)
- SOC device realizes the seamless connection between programmable logic device and embedded processor
- Onboard usb-jtag debugger
- On board HDMI connector and its circuit
- Onboard camera connector (DVP interface)
- Onboard wson8 pad (32Mbit nor flash default)

| Update record of this document | |
|---|---|
| V1.0 | Edited on August 7, 2021; Original document |
| | |

| Hardware overview | |
|---|---|
| Hard core processor | • Cortex-M3 32-bit RISC kernel；ARM3v7M Architecture<br>• Maximum operating frequency : 80MHz<br>• Hardware division and single cycle multiplication<br>• 26 interrupts with 8 priorities |
| Logic cells<br>(4-input LUT4) | Quantity：4608 |
| Register(FF) | Quantity：3456 |
| Block static random access memory B-SRAM(bits) | Capacity：180K |
| 18 x 18 Multiplier | Quantity：16 |
| User flash memory | Embedded 256Kb storage space |
| HyperRAM | Capacity：64Mb ； Bit width：8bits |
| Flexible PLL resources | • 2 PLL<br>• Realize the frequency doubling, frequency division and phase shift<br>• Global clock network resources |
| Display screen interface | HDMI connector and its circuit |
| Camera connector | 24P 0.5mm spacing FPC connector (common DVP camera sequence) |
| Debugger | On board bl702 chip provides JTAG debugging function for GW1NSR |
| IO | • Support 4mA, 8mA, 16mA, 24mA and other driving capabilities<br>• Independent bus keeper, pull-up / pull-down resistor and open drain output options are provided for each I/O<br>• Support Mipi interface |
| Push button | 2 programmable Push buttons |
| LED | On board 1 programmable LED |
| Number of GPIO | 38 |

| Software overview | |
|---|---|
| IDE | Support Gowin IDE(Version>1.9.7) ； Support Gowin Synthesis |
| Floating License | 45.33.107.56:10559 |
| Off-line License | Send application email to support@sipeed.com<br>Example of mail title ： 【Apply Tang Lic】MAC: xxxxxx |
| IDE | http://www.gowinsemi.com.cn/faq.aspx |
| MCU development documents | http://www.gowinsemi.com.cn/down.aspx?TypeId=317&Id=394 |
| GOAI brief introduction | http://www.gowinsemi.com.cn/down.aspx?TypeId=666&Id=757 |
| GOAI Official project | https://github.com/gowinsemi/GoAI |
| Sipeed Reference example | https://github.com/sipeed/TangNano-4K-example |

| Working conditions | |
|---|---|
| Power supply demand | TYPE-C connector：5V±10% 0.5A |
| Temperature rise | <30K |
| Operating ambient temperature range | -10℃ ～ 65℃ |

## Appearance drawing
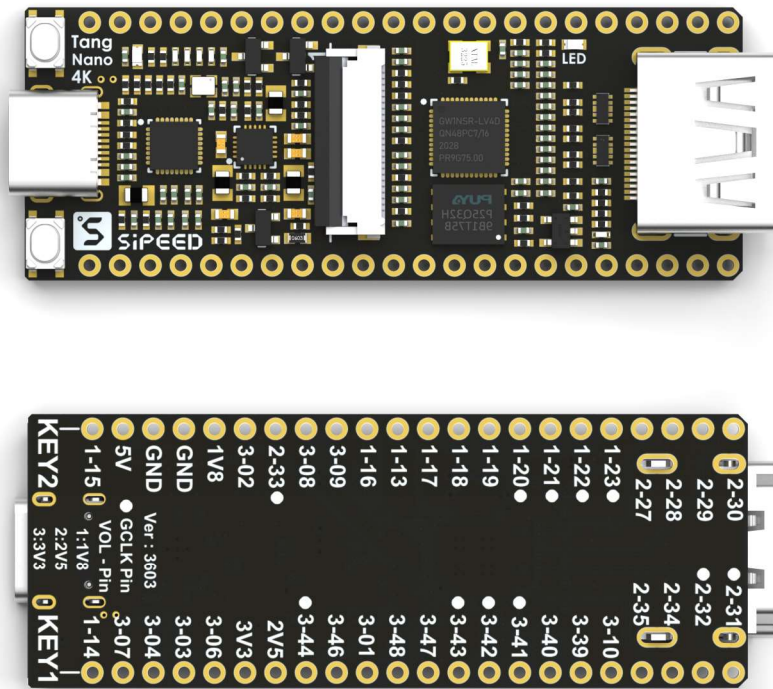
## Functional annotation
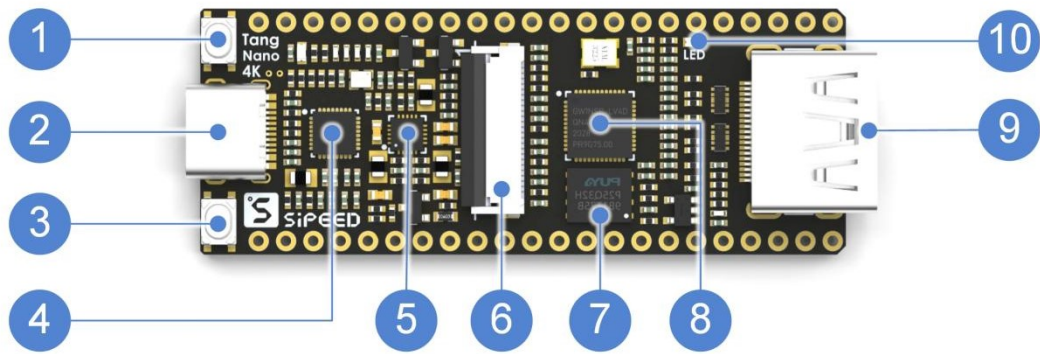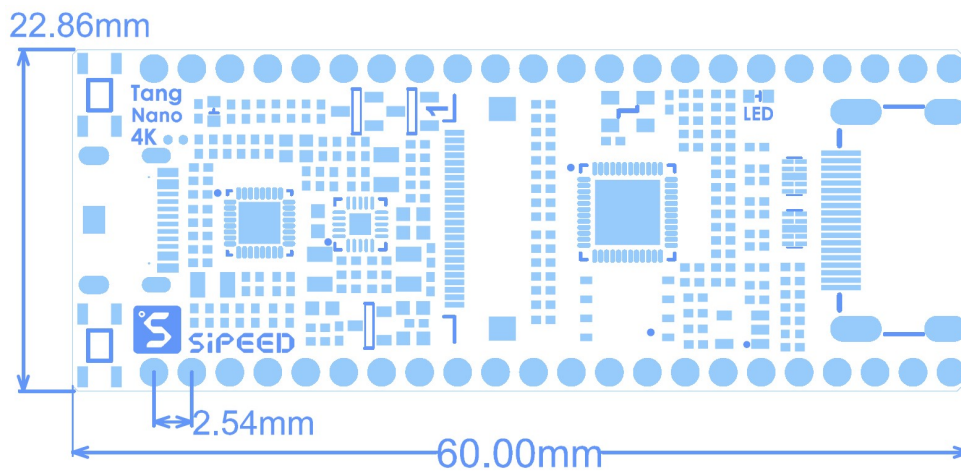


| | | | | | |
|---|---|---|---|---|---|
| **1** Push Button | | **2** JTAG-USB port | | **3** Push Button | |
| **4** BL702 | | **5** TMI7003 | | **6** Camera Connector | |
| **7** Nor Flash | | **8** GW1NSR-LV4C | | **9** HDMI Connector | |
| **10** LED | | | | | |

| Dimension information | |
|---|---|
| Length | 60.0 mm |
| Width | 22.86mm |
| Thickness | Please check the 3D drawing |

| Matters needing attention | |
|---|---|
| ESD protection | Please pay attention to avoid static electricity hitting PCBA; Please release the static electricity from the handle before contacting PCBA |
| Tolerance voltage | The working voltage of each GPIO has been marked in the schematic . Please do not let the actual working voltage of GPIO exceed the rated value, otherwise it will cause permanent damage to PCBA |
| FPC connector | When connecting FPC flexible cable, please ensure that the cable is completely inserted into the cable without offset; |
| Plugging | Please disconnect the power completely before plugging in and out the camera |
| Avoid short circuit | Please avoid any liquid or metal touching the pads of components on PCBA during power on, otherwise it will cause short circuit and burn PCBA |
| Please avoid using these GPIO. | • JTAG : IOT2A/IOT2B/IOT3A/IOT3B/IOT4B<br>• MODE : IOT7A<br>• DONE : IOT5B<br>If you must use these GPIO, please read the following documents:<br><Ug292-1.0 schematic diagram instruction manual> |

| Resources | |
|---|---|
| Official website | www.sipeed.com |
| Github | https://github.com/Sipeed |
| BBS | http://bbs.sipeed.com |
| Wiki | wiki.sipeed.com |
| Sipeed Model platform | https://maixhub.com/ |
| SDK /HDK Relevant information | https://dl.sipeed.com/ |
| E-mail (Technical support and business cooperation) | support@sipeed.com |