# VisionSOM-STM32MP1 Datasheet and Pinout

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## General description


The VisionSOM-STM32MP1 family is a SODIMM-sized SoM based on the STMicroelectronics STM32MP1 application processor which features an advanced implementation of a single or dual ARM Cortex-A7 cores (at speed up to 650MHz) and ARM Cortex-M4 core (at speed up to 209MHz) as well as a 3D Graphics Processing Unit (GPU) Open GL 2.0 ES compatible.

The VisionSOM-STM32MP1 is a general-purpose highly integrated SoM (System on Module) featuring high computation power and 802.11b/g/n Wi-Fi and Bluetooth v5.1 connectivity. The option of integrated, fully certified Wi-Fi and Bluetooth module simplifies the carrier board design and is ideally suited for wireless application. The VisionSOM-STM32MP1 provides a variety memory configuration including flexible range of DDR3L, eMMC and SD memory card that meets our customers requirements.

The SoM supports connections to a variety of interfaces: two high-speed USB on-the-go with PHY, dual Ethernet, audio, display with touch panel and serial interfaces. In addition, the system supports industrial grade embedded applications.

SoMLabs also provides a complete hardware and software development board for the SoM in the form of a carrier board and

optional TFT display and touch panel.

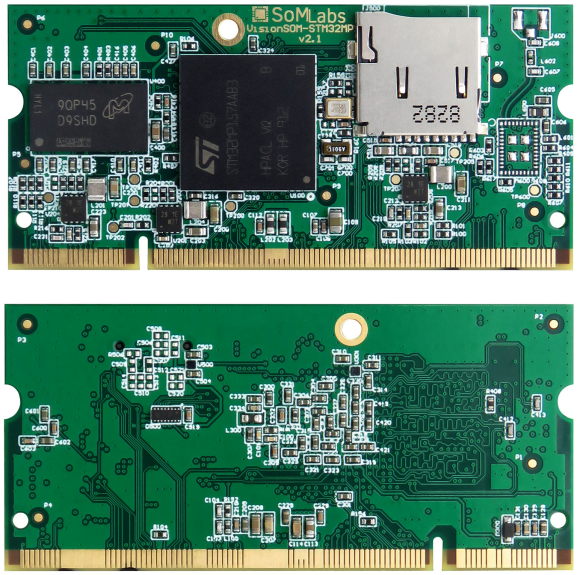
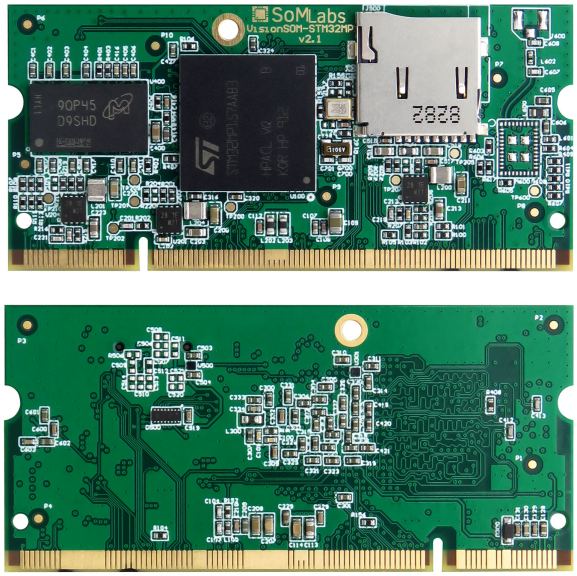
## Applications

- Industrial embedded Linux computer
- Home Appliances
- Home Automation – Smart Home
- Human-machine Interfaces (HMI)
- Point-of-sales (POS) terminals
- Cash Register
- 2D barcode scanners and printers
- Smart grid infrastructure
- IoT gateways
- Residential gateways
- Machine vision equipment
- Robotics
- Fitness/outdoor equipment

## Features

- Powered by STMicroelectronics STM32MP1 application processor
- Single or dual ARM Cortex-A7 cores at speed up to 800MHz
- ARM Cortex-M4 core at speed up to 209MHz
- Up to 512MB SDRAM DDR3L
- Up to 32GB eMMC memory or uSD memory card
- Optional Murata 802.11b/g/n Wi-Fi and Bluetooth v5.1+EDR module
- Power-efficient and cost-optimized solution
- Ideal for industrial IoT and embedded applications
- Integrated security features

## Pictures of SOM versions

| Version | Photo |
|---|---|
| eMMC |  |
| micro-SD |  |

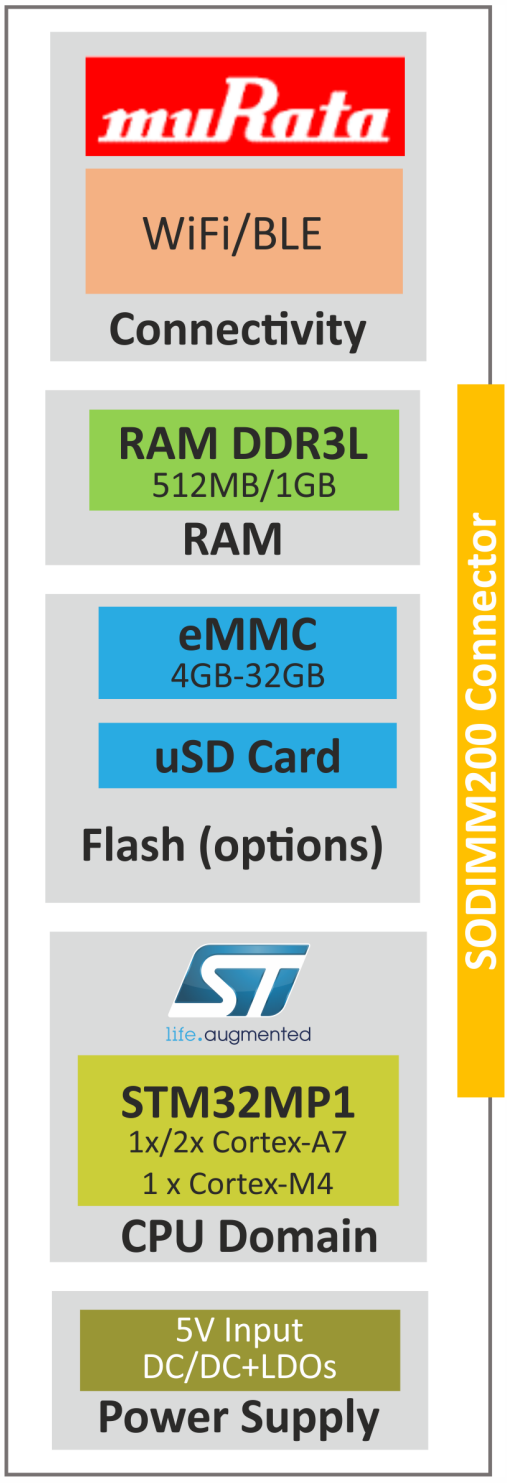
WiFi/BT module is available for all memory variants configurations.

## Ordering info

# SLS18CpuType_Clock_RamSize_FlashSize_SF_TEMP_V

| | |
|---|---|
| SLS | Product type<br>SLS - System on Module |
| 1 | SOM Name<br>1 - VisionSOM SODIMM200 |
| 8 | CPU Family<br>8 - STM32MP1 |
| CpuType | CPU Type<br>MP151A - STM32MP151A<br>MP157A - STM32MP157A |
| Clock | CPU Clock Speed<br>650C - 650MHz |
| RamSize | DDR3 RAM Size<br>256R - 256MB<br>512R - 512MB |
| FlashSize | Flash Size Type and Density<br>uSD - MicroSD connector<br>04GE - 4GB eMMC<br>08GE - 8GB eMMC<br>16GE - 16GB eMMC<br>32GE - 32GB eMMC |
| SF | Special Features<br>0SF - No Special Features<br>1WB - Built-in 802.11b/g/n Wi-Fi and Bluetooth v5.1 Module (Murata 1DX) |
| TEMP | Operating Temperature<br>C - Consumer: 0 to +70 C<br>E - Extended: -25 to +70 C<br>I - Industrial: -40 to +85 C |
| V | SOM Version<br>A - Version 2.1 |

## Block Diagram



## Operating ranges

| Parameter | Value | Unit | Comment |
|---|---|---|---|
| Power Supply | 5.0 | V | Connected to +5VIN SODIMM pin |
| Input GPIO voltage | 3.3 | V | - |
| Environment temperature[1] | -40...+85 | °C | Industrial range w/o WiFi module |
| | -30...+70 | | Industrial range with WiFi module |
| | 0...+70 | | Consumer range |

Note:
1. Maximum MPU junction temperature is +125°C.

## Electrical parameters

| SOM signal name | Parameter | Value | | | Units |
|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | |
| +5VIN | Supply Voltage | 4.0 | 5.0 | 5.5 | V |
| - | Total Supply Current[1] | TBD | TBD | TBD | A |
| VGPIO | GPIO Input Voltage | 0 | 3.3 | 3.9[2] | V |
| +3.3VOUT | SOM Internal LDO Output Current | - | - | 0.5 | A |
| USB-OTGx-VBUS | USB Supply | 4.40 | - | 5.25 | V |
| VDD-COIN-3V | SNVS Backup Battery Supply | 1.4 | - | 3.6 | V |
| - | ADC Inputs Voltage | 0 | - | 3.3 | V |

Notes:
1. Excluding external load connected to +3.3VOUT lines.
2. Applying the maximum voltage 3.6V results in shorten lifetime. Recommended value is smaller than 3.45V.

## SoM pinout

Important notes
1. Detail pin configurations description you can find, edit and arrange in dedicated IOC files (with free "STM32CubeMX" configurational tool): VisionSOM-STM32MP157.
2. "LCD-DATAx (GND)" pins have been retained for compatibility with the modules VisionSOM-6ULL and VisionSOM-RT and are internally connected to GND.

| SODIMM PIN | GPIO name | Default function | Notes |
|---|---|---|---|
| 1 | | GND | |
| 2 | | GND | |
| 3 | | PWR-LP | |
| 4 | | STM32-NRST | MPU reset in + on-board SD card power rail off |
| 5 | | PWR-ON | |
| 6 | | VDD-3V3 | MPU VDD power rail (for BOOT lines voltage reference only) |
| 7 | | BOOT1 | |
| 8 | | VDD-COIN-3V | External 3V battery input (optionally) |
| 9 | | BOOT0 | |
| 10 | | BOOT2 | |
| 11 | | USB-OTG1-VBUS | Analog USB interface line |
| 15 | | GND | |
| 17 | | GND | |
| 19 | | USB-OTG1-DP | Analog USB interface line |
| 20 | | GND | |
| 21 | | USB-OTG1-DN | Analog USB interface line |
| 22 | | GND | |
| 23 | | GND | |
| 25 | | USB-OTG2-DP | Analog USB interface line |
| 26 | | GND | |
| 27 | | USB-OTG2-DN | Analog USB interface line |
| 28 | | GND | |
| 29 | | GND | |
| 35 | | GND | |
| 38 | | GND | |
| 40 | | GND | |
| 41 | | GND | |
| 43 | | JTAG-TDI | JTAG interface |
| 45 | PG10 | GPIO-PG10 | |
| 46 | | JTAG-TMS | JTAG interface |
| 47 | PC3 | GPIO-PC3-ADC1-13 | |
| 48 | | JTAG-nRST | JTAG interface |
| 49 | PD13 | GPIO-PD13 | |
| 50 | | GND | |
| 51 | | GND | |
| 52 | | JTAG-TDO | JTAG interface |
| 53 | PC1 | ENET1-MDC | |

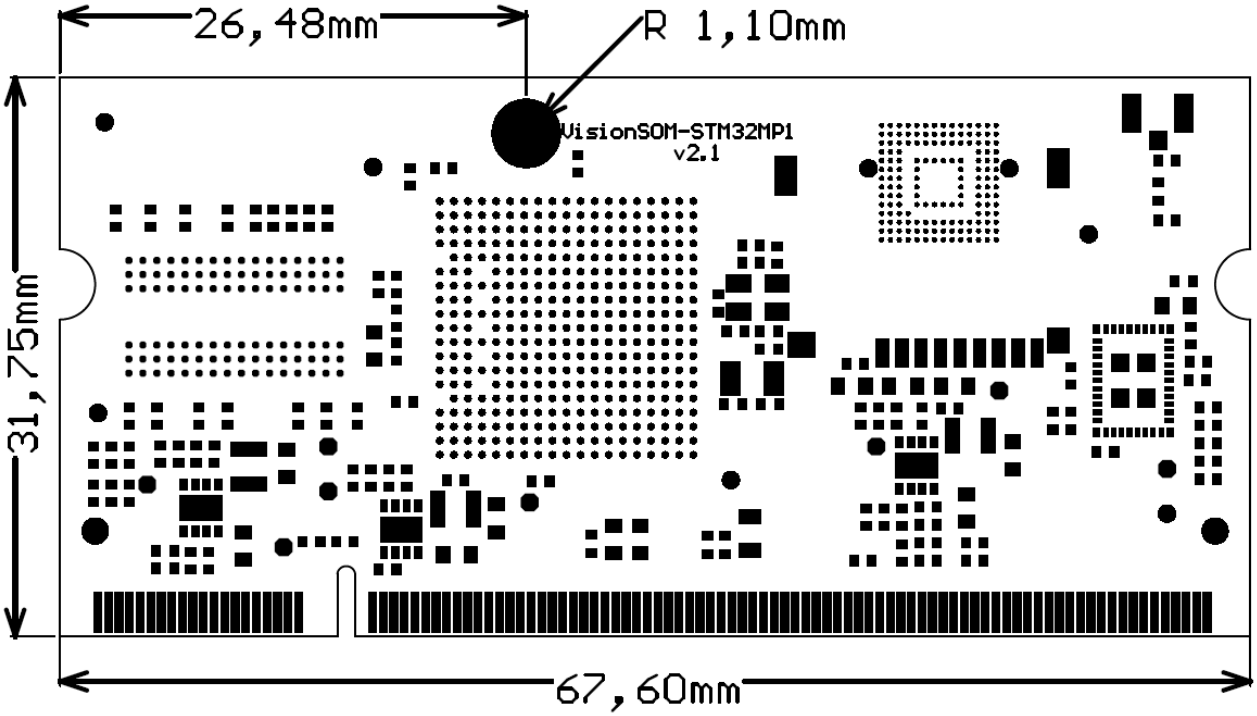
| | | | |
|---|---|---|---|
| 54 | | JTAG-TCK | JTAG interface |
| 55 | PC0 | GPIO-PC0-ADC1-10 | |
| 56 | PB7 | GPIO-PB7 | By default I2C4_SDA |
| 57 | PE1 | UART8-TXD | |
| 58 | PB1 | GPIO-PB1-ADC1-5 | |
| 59 | | GND | |
| 60 | | GND | |
| 61 | PA2 | ENET1-MDIO | |
| 62 | PA0 | GPIO-PA0-ADC1-16 | |
| 63 | PE0 | UART8-RXD | |
| 64 | PF10 | GPIO-PF10 | |
| 65 | PD8 | USART3-TXD | |
| 66 | PD14 | UART8-CTS | |
| 67 | PD9 | USART3-RXD | |
| 68 | PG9 | USART6-RXD | |
| 69 | PA10 | USART1-RXD | |
| 70 | | GND | |
| 71 | | GND | |
| 72 | PD11 | USART3-CTS | |
| 73 | PB6 | USART1-TXD | |
| 74 | PG7 | UART8-RTS | |
| 75 | PG11 | UART4-TXD | |
| 76 | PA11 | USART1-CTS | |
| 77 | PB2 | UART4-RXD | |
| 78 | PD12 | USART3-RTS | |
| 79 | PG14 | USART6-TXD | |
| 80 | PA12 | USART1-RTS | |
| 81 | | GND | |
| 82 | | GND | |
| 84 | | GND | |
| 85 | | VOUT-3V3 | 3,3V out |
| 87 | | VOUT-3V3 | 3,3V out |
| 88 | | VOUT-3V3 | 3,3V out |
| 89 | | VOUT-3V3 | 3,3V out |
| 90 | | VOUT-3V3 | 3,3V out |
| 91 | | VOUT-3V3 | 3,3V out |
| 92 | | VOUT-3V3 | 3,3V out |
| 93 | | VOUT-3V3 | 3,3V out |
| 96 | | VDD-5V | 5V input |
| 97 | PC4 | ENET1-RXD0 | |
| 98 | | VDD-5V | 5V input |
| 99 | PC5 | ENET1-RXD1 | |
| 100 | | VDD-5V | 5V input |
| 101 | PA7 | ENET1-CRS-DV | |
| 102 | | VDD-5V | 5V input |
| 103 | | GND | |

| | | | |
|---|---|---|---|
| 104 | | VDD-5V | 5V input |
| 106 | | VDD-5V | 5V input |
| 107 | | GND | |
| 108 | | VDD-5V | 5V input |
| 109 | PG12 | GPIO-PG12 | |
| 110 | | VDD-5V | 5V input |
| 111 | PD15 | GPIO-PD15 | |
| 112 | | VDD-5V | 5V input |
| 113 | PA13 | GPIO-PA13 | |
| 114 | PB11 | ENET1-TXD-EN | |
| 115 | | GND | |
| 116 | | GND | |
| 117 | PA14 | GPIO-PA14 | |
| 118 | PB5 | ENET1-CLK | RC LPF built-in series (10R) |
| 119 | PC2 | GPIO-PC2 | |
| 120 | | GND | |
| 121 | PE2 | GPIO-PE2 | By default I2C4_SCL |
| 122 | PG13 | ENET1-TXD0 | |
| 124 | PB13 | ENET1-TXD1 | |
| 125 | | GND | |
| 127 | | GND | |
| 128 | | GND | |
| 129 | PA9 | LCD-R5 | |
| 130 | | GND | |
| 131 | PA8 | LCD-R6 | |
| 132 | | GND | |
| 133 | | LCD-DATA17 (GND) | Internally connected to GND |
| 134 | PE15 | LCD-R7 | |
| 135 | | GND | |
| 136 | | GND | |
| 137 | PC10 | LCD-R2 | |
| 138 | PB0 | LCD-R3 | |
| 139 | PF11 | LCD-G5 | |
| 140 | PA5 | LCD-R4 | |
| 141 | PC7 | LCD-G6 | |
| 142 | PG8 | LCD-G7 | |
| 143 | | LCD-DATA8 (GND) | Internally connected to GND |
| 144 | | LCD-DATA16 (GND) | Internally connected to GND |
| 145 | | LCD-DATA9 (GND) | Internally connected to GND |
| 146 | | GND | |
| 147 | | GND | |
| 148 | PE11 | LCD-G3 | |
| 149 | PA3 | LCD-B5 | |
| 150 | PB10 | LCD-G4 | |
| 151 | PB8 | LCD-B6 | |
| 152 | PA6 | LCD-G2 | |

| | | | |
|---|---|---|---|
| 153 | | LCD-DATA0 (GND) | Internally connected to GND |
| 154 | PD10 | LCD-B3 | |
| 155 | | LCD-DATA1 (GND) | Internally connected to GND |
| 156 | | GND | |
| 157 | PA1 | GPIO-PA1 | |
| 158 | PE12 | LCD-B4 | |
| 159 | | GND | |
| 160 | PC6 | LCD-HSYNC | |
| 161 | PE14 | LCD-CLK | |
| 162 | PA4 | LCD-VSYNC | |
| 163 | PE13 | LCD-DE | |
| 164 | PD6 | LCD-B2 | |
| 165 | | GND | |
| 166 | PB9 | LCD-B7 | |
| 167 | PB14 | SD2-DATA0 | |
| 168 | | GND | |
| 169 | PB4 | SD2-DATA3 | |
| 170 | | GND | |
| 171 | PB15 | SD2-DATA1 | |
| 172 | | GND | |
| 173 | PG6 | SD2-CMD | |
| 174 | | GND | |
| 175 | PB3 | SD2-DATA2 | |
| 176 | | GND | |
| 177 | | GND | |
| 178 | | GND | |
| 179 | PE3 | SD2-CLK | |
| 180 | | GND | |
| 181 | | GND | |
| 182 | | GND | |
| 184 | | GND | |
| 185 | | GND | |
| 186 | | DSI-D0N | Dedicated MIPI-DSI line |
| 188 | | DSI-D0P | Dedicated MIPI-DSI line |
| 189 | | GND | |
| 192 | | DSI-D1N | Dedicated MIPI-DSI line |
| 193 | | DSI-CK-N | Dedicated MIPI-DSI line |
| 194 | | DSI-D1P | Dedicated MIPI-DSI line |
| 195 | | DSI-CK-P | Dedicated MIPI-DSI line |
| 199 | | GND | |
| 200 | | GND | |
| - | PA15 | SD1-DATA5 | Internal Flash/SD |
| - | PB12 | WLAN-HWAKE | |
| - | PC8 | SD1-DATA0 | Internal Flash/SD |
| - | PC9 | SD1-DATA1 | Internal Flash/SD |
| - | PC11 | SD1-DATA3 | Internal Flash/SD |

| | | | |
|---|---|---|---|
| - | PC12 | SD1-CLK | Internal Flash/SD |
| - | PC13 | 32kHz-OUT | 1DX WiFi module line |
| - | PC14 | OSCI | |
| - | PC15 | OSCO | |
| - | PD0 | SD3-CMD | 1DX WiFi module line |
| - | PD1 | SD3-DATA0 | 1DX WiFi module line |
| - | PD4 | SD3-DATA1 | 1DX WiFi module line |
| - | PD5 | SD3-DATA2 | 1DX WiFi module line |
| - | PD7 | SD3-DATA3 | 1DX WiFi module line |
| - | PE4 | SD1-DATA4 | Internal Flash/SD |
| - | PE5 | SD1-DATA6 | Internal Flash/SD |
| - | PE6 | SD1-DATA2 | Internal Flash/SD |
| - | PE9 | BT-ENABLE | 1DX Bluetooth module line |
| - | PE10 | UART7-CTS | 1DX Bluetooth module line |
| - | PF6 | BT-HWAKE | 1DX Bluetooth module line |
| - | PF7 | BT-WAKE | 1DX Bluetooth module line |
| - | PF8 | UART7-RTS | 1DX Bluetooth module line |
| - | PF9 | WLAN-ENABLE | 1DX WiFi module line |
| - | PG15 | SD3-CLK | 1DX WiFi module line |
| | PD2 | SD1-CMD | Internal Flash/SD |
| | PD3 | SD1-DATA7 | Internal Flash/SD |
| | PE7 | UART7-RXD | 1DX Bluetooth module line |
| | PE8 | UART7-TXD | 1DX Bluetooth module line |

## Dimensions



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