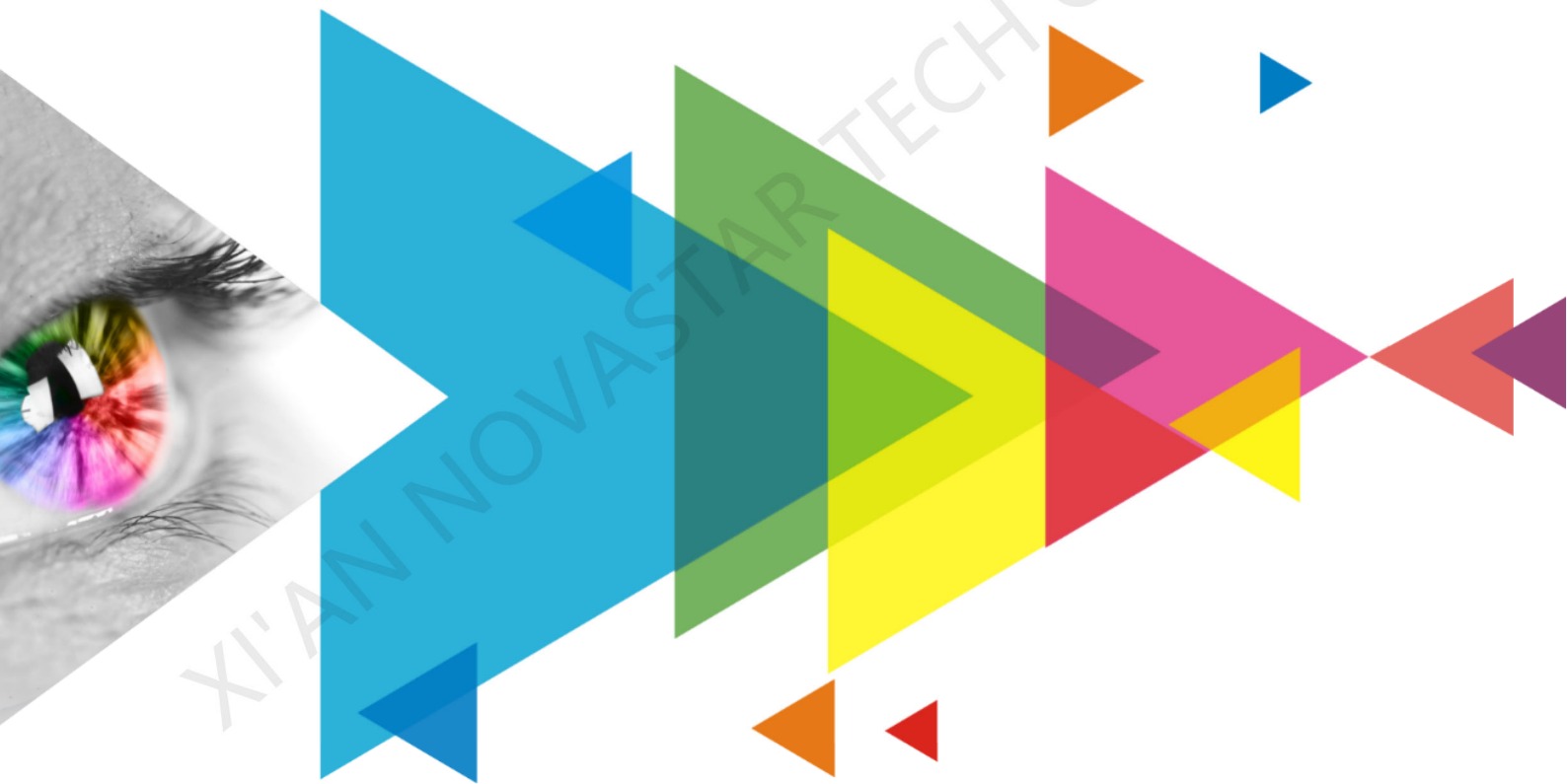


# A10s Plus

## Receiving Card

V1.0.3



Specifications

## Change History

| Document Version | Release Date | Description                                                                                                                                                                                                                                                          |
|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| V1.0.3           | 2021-02-26   | <ul style="list-style-type: none"> <li>Updated the appearance diagram.</li> <li>Updated the dimensions diagram.</li> </ul>                                                                                                                                           |
| V1.0.2           | 2020-07-01   | <ul style="list-style-type: none"> <li>Updated the firmware version.</li> <li>Updated the indicator description.</li> <li>Updated the side dimensions diagram.</li> <li>Optimized the feature description.</li> <li>Optimized the pin description tables.</li> </ul> |
| V1.0.1           | 2019-10-30   | Increased the version number only.                                                                                                                                                                                                                                   |
| V1.0.0           | 2019-05-24   | First release                                                                                                                                                                                                                                                        |

## Introduction

The A10s Plus is a high-end small receiving card developed by NovaStar. A single A10s Plus loads up to 512×512 pixels. Adopting the exclusive Image Booster Engine technology of NovaStar, the A10s Plus can precisely calibrate the color gamut and grayscale of the screen, and improve the grayscale by 64 times. It also supports the pixel level brightness and chroma calibration, individual Gamma adjustment for RGB, low latency, 3D and HDR functions, greatly improving the brightness, grayscale and color performance from every aspect and offering users an ultimate visual experience with a uniform, smooth and lifelike image.

The A10s Plus uses high-density connectors for communication to limit the effects of dust and vibration, resulting in high stability. It supports up to 32 groups of parallel RGB data or 64 groups of serial data (expandable to 128 groups of serial data). Its reserved pins allow for custom functions of users. Thanks to its EMC Class B compliant hardware design, the A10s Plus has improved electromagnetic compatibility and is suitable to various on-site setups that have high requirements.

## Features

### Improvements to Display Effect

- Image Booster Engine  
The Image Booster Engine has the following 3 functions which improve the display effect (the actual effect depends on the driver IC) from different dimensions.
  - Color Management: Switch the color gamut of the screen between multiple gamuts to enable more precise colors on the screen.
  - Precise Grayscale: Individually correct the 65,536 levels of grayscale (16bit) of the driver IC to fix the display problems at low grayscale conditions, such as brightness spikes, brightness dips, color cast and mottling. This function can also better assist other display technologies, such as 22bit+ and individual Gamma adjustment for RGB, allowing for a smoother and uniform image.
  - 22bit+: Improve the LED display grayscale by 64 times to avoid grayscale loss due to

low brightness and allow for more details in dark areas and a smoother image.

NovaLCT V5.3.1 or later is required.

- Pixel level brightness and chroma calibration  
Working with NovaLCT and NovaCLB, the receiving card supports brightness and chroma calibration on each LED, which can effectively remove color discrepancies and greatly improve LED display brightness and chroma consistency, allowing for better image quality.
- Quick adjustment of dark or bright lines  
The dark or bright lines caused by splicing of cabinets or modules can be adjusted to improve the visual experience. This function is easy to use and the adjustment takes effect immediately.
- Low latency  
The latency of video source on the receiving card end can be reduced to 1 frame (only when using modules with driver IC with built-in RAM).
- 3D function  
Working with the independent controller which supports 3D function, the receiving card supports 3D image output.
- Individual Gamma adjustment for RGB  
Working with NovaLCT (V5.2.0 or later) and the independent controller which supports this function, the receiving card supports individual adjustment of red Gamma, green Gamma and blue Gamma, which can effectively control image non-uniformity under low grayscale and white balance offset, allowing for a more realistic image.
- Image rotation in 90° increments  
The display image can be set to rotate in multiples of 90° (0°/ 90°/180°/270°).
- Image rotation at any angle  
Working with the MCTRL R5 LED display controller and SmartLCT, the receiving card supports image rotation at any angle.
- HDR  
Supports HDR10 and HLG video sources.  
  
Working with the independent controller which supports the HDR function, the receiving card can reproduce the original brightness range and color space of the video source, allowing for a more lifelike image.

## Improvements to Maintainability

- Smart module (dedicated firmware required)  
Working with the smart module, the receiving card supports module ID management, storage of calibration coefficients and module parameters, monitoring of module temperature, voltage and flat cable communication status, LED error detection, and recording of the module run time.
- Automatic module calibration  
After a new module with flash memory is installed to replace the old one, the calibration coefficients stored in the flash memory can be automatically uploaded to the receiving card when it is powered on.
- Module Flash management  
For modules with flash memory, the information stored in the memory can be managed. The calibration coefficients and module ID can be stored and read back.
- One click to apply calibration coefficients stored in module Flash  
For modules with flash memory, if the Ethernet cable is disconnected, users can hold down the self-test button on the cabinet to upload the calibration coefficients in the flash memory of the module to the receiving card.
- Mapping function  
The cabinets display the receiving card number and Ethernet port information, allowing users to easily obtain the locations and connection topology of receiving cards.
- Setting of a pre-stored image in receiving card  
The image displayed on the screen during startup, or displayed when the Ethernet cable is disconnected or there is no video signal can be customized.
- Temperature and voltage monitoring  
The temperature and voltage of the receiving card can be monitored without using peripherals.
- Cabinet LCD  
The LCD module connected to the cabinet can display the temperature, voltage, single run time and total run time of the receiving card.

- Bit error detection  
The Ethernet port communication quality of the receiving card can be monitored and the number of erroneous packets can be recorded to help troubleshoot network communication problems.  
NovaLCT V5.2.0 or later is required.
- Status detection of dual power supplies  
When two power supplies are connected, their working status can be detected by the receiving card.
- Firmware program readback  
The firmware program of the receiving card can be read back and saved to the local computer.  
NovaLCT V5.2.0 or later is required.
- Configuration parameter readback  
The configuration parameters of the receiving card can be read back and saved to the local computer.
- LVDS transmission (dedicated firmware required)  
Low-voltage differential signaling (LVDS) transmission is used to reduce the number of data cables from the hub board to module, increase the transmission distance, and improve the signal transmission quality and electromagnetic compatibility (EMC).

### Improvements to Reliability

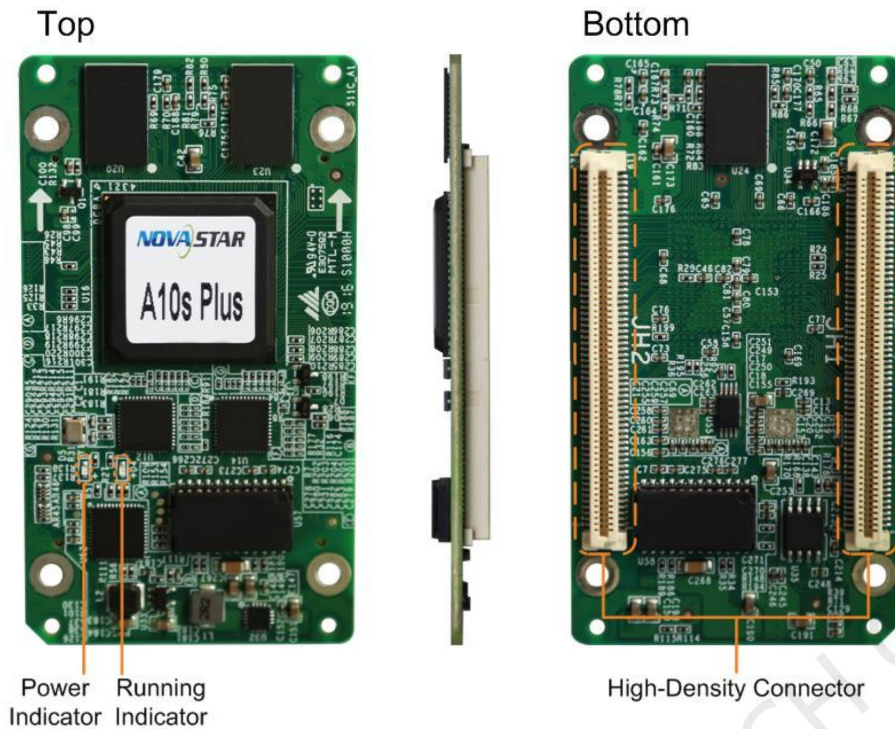
- Dual card backup and status monitoring  
In an application with requirements for high reliability, two receiving cards can be mounted onto a single hub board for backup. In the case

that the main receiving card fails, the backup card will serve to ensure uninterrupted operation of the display.

The working status of the main and backup receiving cards can be monitored in NovaLCT V5.2.0 or later.

- Loop backup  
The receiving cards and the sending card form a loop via the main and backup line connections. If a fault occurs at a location of the lines, the screen can still display the image normally.
- Dual backup of configuration parameters  
The receiving card configuration parameters are stored in the application area and factory area of the receiving card at the same time. Users usually use the configuration parameters in the application area. If necessary, users can restore the configuration parameters in the factory area to the application area.
- Dual backup of the application program  
Two copies of the application program are stored in the receiving card at the factory to avoid the problem that the receiving card may get stuck due to program update exception.
- Dual backup of calibration coefficients  
The calibration coefficients are stored in the application area and factory area of the receiving card at the same time. Users usually use the calibration coefficients in the application area. If necessary, users can restore the calibration coefficients in the factory area to the application area.

## Appearance



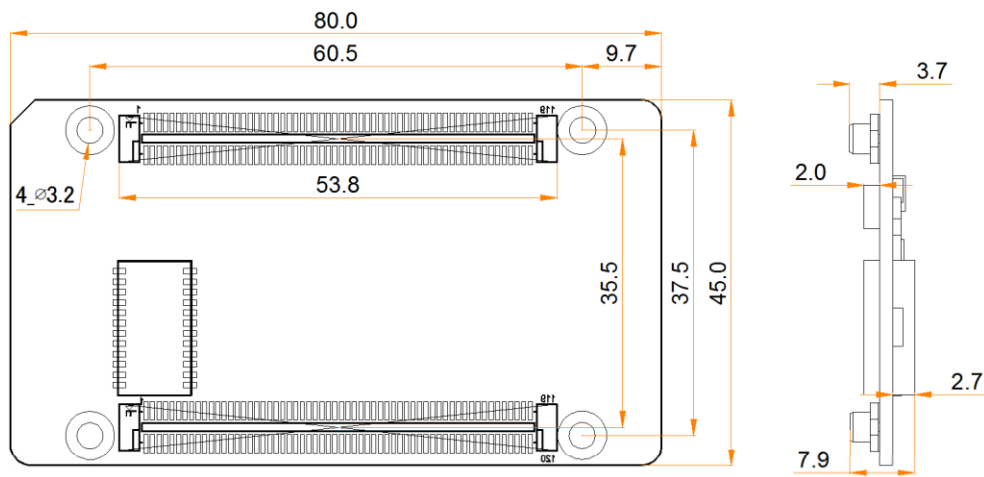
All product pictures shown in this document are for illustration purpose only. Actual product may vary.

## Indicators

| Indicator         | Color | Status                      | Description                                                                                                           |
|-------------------|-------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Running indicator | Green | Flashing once every 1s      | The receiving card is functioning normally. Ethernet cable connection is normal, and video source input is available. |
|                   |       | Flashing once every 3s      | Ethernet cable connection is abnormal.                                                                                |
|                   |       | Flashing 3 times every 0.5s | Ethernet cable connection is normal, but no video source input is available.                                          |
|                   |       | Flashing once every 0.2s    | The receiving card failed to load the program in the application area and now is using the backup program.            |
|                   |       | Flashing 8 times every 0.5s | A redundancy switchover occurred on the Ethernet port and the loop backup has taken effect.                           |
| Power indicator   | Red   | Always on                   | The power input is normal.                                                                                            |

## Dimensions

The board thickness is not greater than 2.0 mm, and the total thickness (board thickness + thickness of components on the top and bottom sides) is not greater than 8.5 mm. Ground connection (GND) is enabled for mounting holes.



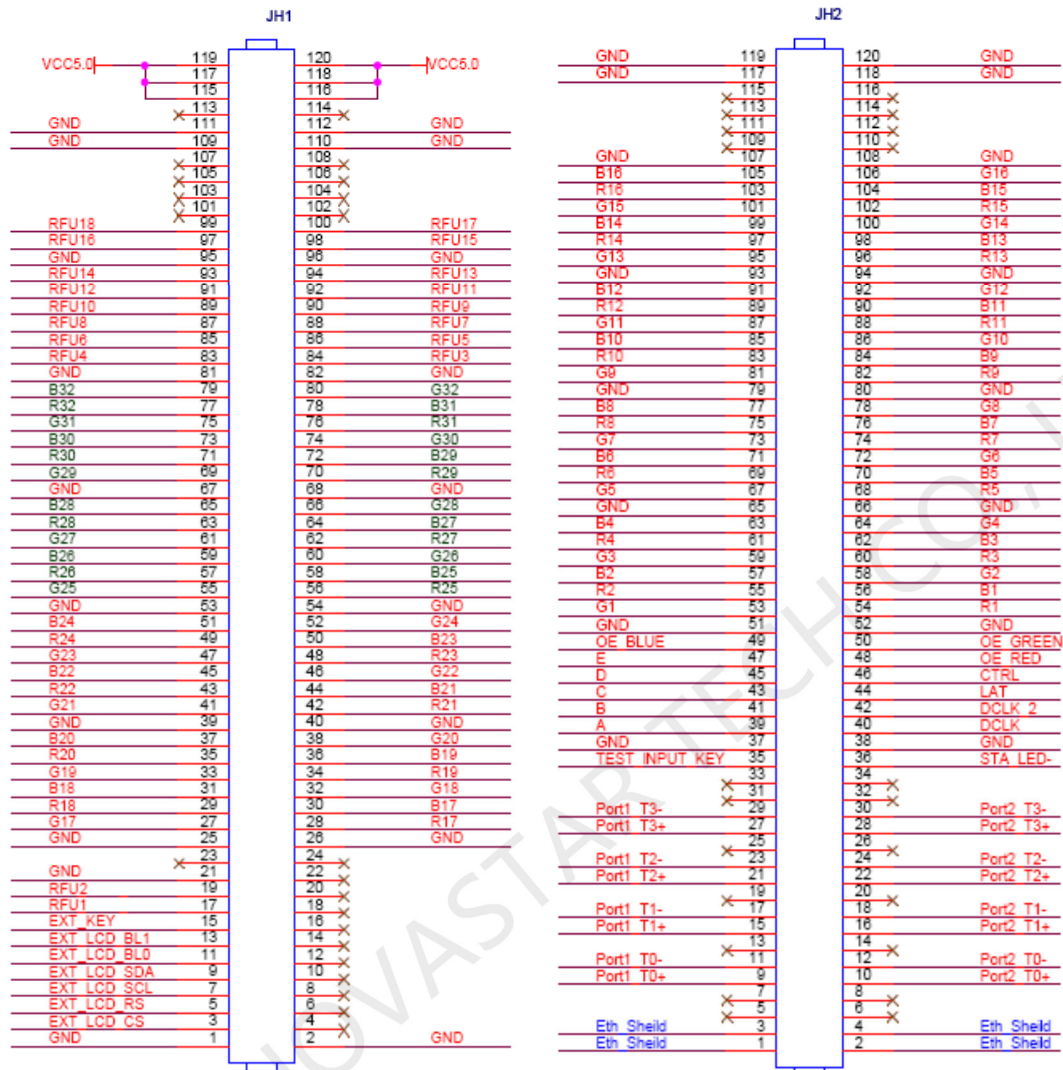
Tolerance:  $\pm 0.3$  Unit: mm

#### Note

The distance between outer surfaces of the A10s Plus and HUB boards after their high-density connectors fit together is 5.0 mm. An 5-mm copper pillar is recommended.

## Pins

### Pins for 32 Groups of Parallel Data



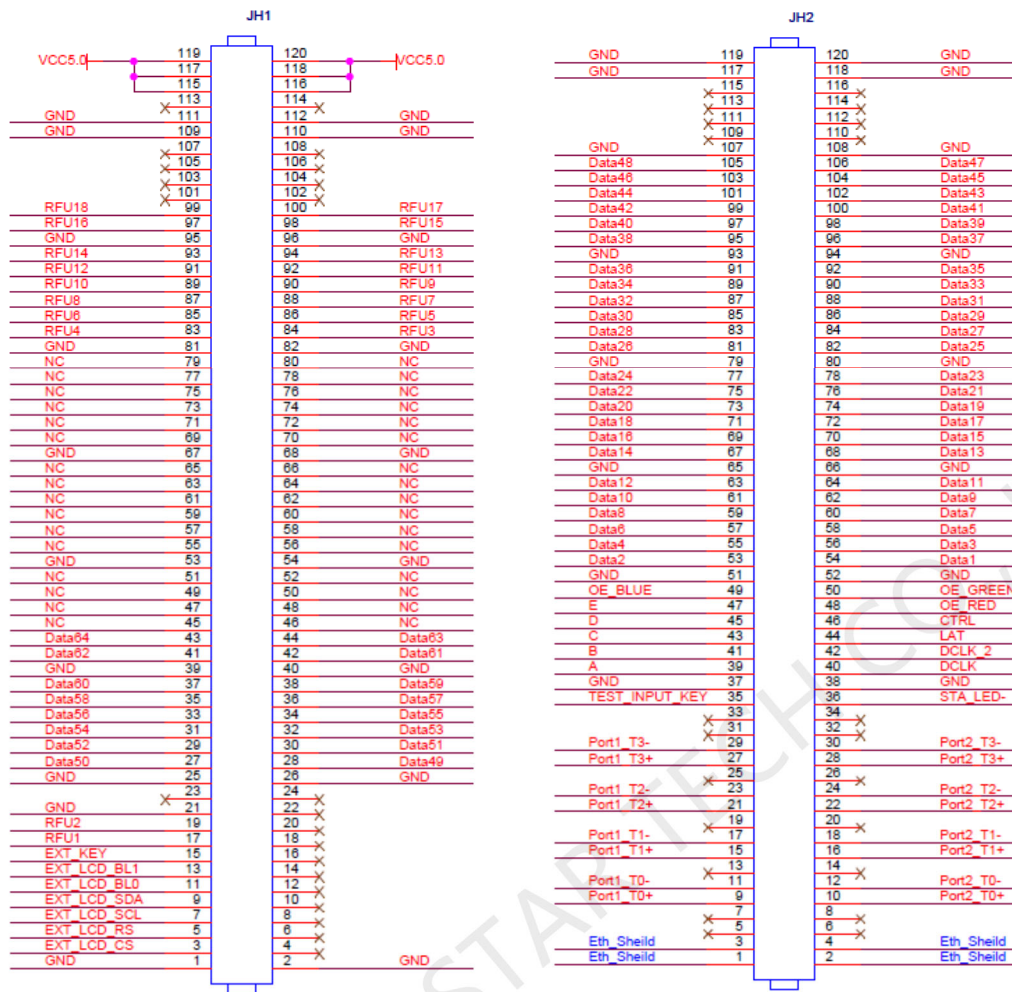
| JH1                    |             |    |    |     |   |
|------------------------|-------------|----|----|-----|---|
|                        | GND         | 1  | 2  | GND |   |
| LCD CS signal          | EXT_LCD_CS  | 3  | 4  | NC  |   |
| LCD RS signal          | EXT_LCD_RS  | 5  | 6  | NC  |   |
| LCD clock signal       | EXT_LCD_SCL | 7  | 8  | NC  |   |
| LCD data signal        | EXT_LCD_SDA | 9  | 10 | NC  |   |
| LCD backlight signal 1 | EXT_LCD_BL0 | 11 | 12 | NC  |   |
| LCD backlight signal 2 | EXT_LCD_BL1 | 13 | 14 | NC  |   |
| LCD control button     | EXT_KEY     | 15 | 16 | NC  |   |
| /                      | RFU1        | 17 | 18 | NC  |   |
| /                      | RFU2        | 19 | 20 | NC  |   |
|                        | GND         | 21 | 22 | NC  |   |
|                        | NC          | 23 | 24 | NC  |   |
|                        | GND         | 25 | 26 | GND |   |
| /                      | G17         | 27 | 28 | R17 | / |
| /                      | R18         | 29 | 30 | B17 | / |
| /                      | B18         | 31 | 32 | G18 | / |
| /                      | G19         | 33 | 34 | R19 | / |
| /                      | R20         | 35 | 36 | B19 | / |
| /                      | B20         | 37 | 38 | G20 | / |
|                        | GND         | 39 | 40 | GND |   |

| JH1 |       |     |     |       |   |
|-----|-------|-----|-----|-------|---|
| /   | G21   | 41  | 42  | R21   | / |
| /   | R22   | 43  | 44  | B21   | / |
| /   | B22   | 45  | 46  | G22   | / |
| /   | G23   | 47  | 48  | R23   | / |
| /   | R24   | 49  | 50  | B23   | / |
| /   | B24   | 51  | 52  | G24   | / |
|     | GND   | 53  | 54  | GND   |   |
| /   | G25   | 55  | 56  | R25   | / |
| /   | R26   | 57  | 58  | B25   | / |
| /   | B26   | 59  | 60  | G26   | / |
| /   | G27   | 61  | 62  | R27   | / |
| /   | R28   | 63  | 64  | B27   | / |
| /   | B28   | 65  | 66  | G28   | / |
|     | GND   | 67  | 68  | GND   |   |
| /   | G29   | 69  | 70  | R29   | / |
| /   | R30   | 71  | 72  | B29   | / |
| /   | B30   | 73  | 74  | G30   | / |
| /   | G31   | 75  | 76  | R31   | / |
| /   | R32   | 77  | 78  | B31   | / |
| /   | B32   | 79  | 80  | G32   | / |
|     | GND   | 81  | 82  | GND   |   |
| /   | RFU4  | 83  | 84  | RFU3  | / |
| /   | RFU6  | 85  | 86  | RFU5  | / |
| /   | RFU8  | 87  | 88  | RFU7  | / |
| /   | RFU10 | 89  | 90  | RFU9  | / |
| /   | RFU12 | 91  | 92  | RFU11 | / |
| /   | RFU14 | 93  | 94  | RFU13 | / |
|     | GND   | 95  | 96  | GND   |   |
| /   | RFU16 | 97  | 98  | RFU15 | / |
| /   | RFU18 | 99  | 100 | RFU17 | / |
|     | NC    | 101 | 102 | NC    |   |
|     | NC    | 103 | 104 | NC    |   |
|     | NC    | 105 | 106 | NC    |   |
|     | NC    | 107 | 108 | NC    |   |
|     | GND   | 109 | 110 | GND   |   |
|     | GND   | 111 | 112 | GND   |   |
|     | NC    | 113 | 114 | NC    |   |
|     | VCC   | 115 | 116 | VCC   |   |
|     | VCC   | 117 | 118 | VCC   |   |
|     | VCC   | 119 | 120 | VCC   |   |

| JH2                   |            |    |    |            |                       |
|-----------------------|------------|----|----|------------|-----------------------|
| Chassis ground        | Eth_Sheild | 1  | 2  | Eth_Sheild | Chassis ground        |
| Chassis ground        | Eth_Sheild | 3  | 4  | Eth_Sheild | Chassis ground        |
|                       | NC         | 5  | 6  | NC         |                       |
|                       | NC         | 7  | 8  | NC         |                       |
| Gigabit Ethernet port | Port1_T0+  | 9  | 10 | Port2_T0+  | Gigabit Ethernet port |
|                       | Port1_T0-  | 11 | 12 | Port2_T0-  |                       |
|                       | NC         | 13 | 14 | NC         |                       |
|                       | Port1_T1+  | 15 | 16 | Port2_T1+  |                       |
|                       | Port1_T1-  | 17 | 18 | Port2_T1-  |                       |
|                       | NC         | 19 | 20 | NC         |                       |
|                       | Port1_T2+  | 21 | 22 | Port2_T2+  |                       |
|                       | Port1_T2-  | 23 | 24 | Port2_T2-  |                       |
|                       | NC         | 25 | 26 | NC         |                       |
|                       | Port1_T3+  | 27 | 28 | Port2_T3+  |                       |
|                       | Port1_T3-  | 29 | 30 | Port2_T3-  |                       |

| JH2                  |                |     |     |          |                                   |
|----------------------|----------------|-----|-----|----------|-----------------------------------|
|                      | NC             | 31  | 32  | NC       |                                   |
|                      | NC             | 33  | 34  | NC       |                                   |
| Test button          | TEST_INPUT_KEY | 35  | 36  | STA_LED- | Running indicator<br>(active low) |
|                      | GND            | 37  | 38  | GND      |                                   |
| Line decoding signal | A              | 39  | 40  | DCLK     | Shift clock output 1              |
| Line decoding signal | B              | 41  | 42  | DCLK_2   | Shift clock output 2              |
| Line decoding signal | C              | 43  | 44  | LAT      | Latch signal output               |
| Line decoding signal | D              | 45  | 46  | CTRL     | Afterglow control signal          |
| Line decoding signal | E              | 47  | 48  | OE_RED   | Display enable                    |
| Display enable       | OE_BLUE        | 49  | 50  | OE_GREEN | Display enable                    |
|                      | GND            | 51  | 52  | GND      |                                   |
| /                    | G1             | 53  | 54  | R1       | /                                 |
| /                    | R2             | 55  | 56  | B1       | /                                 |
| /                    | B2             | 57  | 58  | G2       | /                                 |
| /                    | G3             | 59  | 60  | R3       | /                                 |
| /                    | R4             | 61  | 62  | B3       | /                                 |
| /                    | B4             | 63  | 64  | G4       | /                                 |
|                      | GND            | 65  | 66  | GND      |                                   |
| /                    | G5             | 67  | 68  | R5       | /                                 |
| /                    | R6             | 69  | 70  | B5       | /                                 |
| /                    | B6             | 71  | 72  | G6       | /                                 |
| /                    | G7             | 73  | 74  | R7       | /                                 |
| /                    | R8             | 75  | 76  | B7       | /                                 |
| /                    | B8             | 77  | 78  | G8       | /                                 |
|                      | GND            | 79  | 80  | GND      |                                   |
| /                    | G9             | 81  | 82  | R9       | /                                 |
| /                    | R10            | 83  | 84  | B9       | /                                 |
| /                    | B10            | 85  | 86  | G10      | /                                 |
| /                    | G11            | 87  | 88  | R11      | /                                 |
| /                    | R12            | 89  | 90  | B11      | /                                 |
| /                    | B12            | 91  | 92  | G12      | /                                 |
|                      | GND            | 93  | 94  | GND      |                                   |
| /                    | G13            | 95  | 96  | R13      | /                                 |
| /                    | R14            | 97  | 98  | B13      | /                                 |
| /                    | B14            | 99  | 100 | G14      | /                                 |
| /                    | G15            | 101 | 102 | R15      | /                                 |
| /                    | R16            | 103 | 104 | B15      | /                                 |
| /                    | B16            | 105 | 106 | G16      | /                                 |
|                      | GND            | 107 | 108 | GND      |                                   |
|                      | NC             | 109 | 110 | NC       |                                   |
|                      | NC             | 111 | 112 | NC       |                                   |
|                      | NC             | 113 | 114 | NC       |                                   |
|                      | NC             | 115 | 116 | NC       |                                   |
|                      | GND            | 117 | 118 | GND      |                                   |
|                      | GND            | 119 | 120 | GND      |                                   |

## Pins for 64 Groups of Serial Data



| JH1                    |             |    |    |        |   |
|------------------------|-------------|----|----|--------|---|
|                        | GND         | 1  | 2  | GND    |   |
| LCD CS signal          | EXT_LCD_CS  | 3  | 4  | NC     |   |
| LCD RS signal          | EXT_LCD_RS  | 5  | 6  | NC     |   |
| LCD clock signal       | EXT_LCD_SCL | 7  | 8  | NC     |   |
| LCD data signal        | EXT_LCD_SDA | 9  | 10 | NC     |   |
| LCD backlight signal 1 | EXT_LCD_BL0 | 11 | 12 | NC     |   |
| LCD backlight signal 2 | EXT_LCD_BL1 | 13 | 14 | NC     |   |
| LCD control button     | EXT_KEY     | 15 | 16 | NC     |   |
| /                      | RFU1        | 17 | 18 | NC     |   |
| /                      | RFU2        | 19 | 20 | NC     |   |
|                        | GND         | 21 | 22 | NC     |   |
|                        | NC          | 23 | 24 | NC     |   |
|                        | GND         | 25 | 26 | GND    |   |
| /                      | Data50      | 27 | 28 | Data49 | / |
| /                      | Data52      | 29 | 30 | Data51 | / |
| /                      | Data54      | 31 | 32 | Data53 | / |
| /                      | Data56      | 33 | 34 | Data55 | / |
| /                      | Data58      | 35 | 36 | Data57 | / |
| /                      | Data60      | 37 | 38 | Data59 | / |
|                        | GND         | 39 | 40 | GND    |   |
| /                      | Data62      | 41 | 42 | Data61 | / |
| /                      | Data64      | 43 | 44 | Data63 | / |

| JH1 |       |     |     |       |   |
|-----|-------|-----|-----|-------|---|
|     | NC    | 45  | 46  | NC    |   |
|     | NC    | 47  | 48  | NC    |   |
|     | NC    | 49  | 50  | NC    |   |
|     | NC    | 51  | 52  | NC    |   |
|     | GND   | 53  | 54  | GND   |   |
|     | NC    | 55  | 56  | NC    |   |
|     | NC    | 57  | 58  | NC    |   |
|     | NC    | 59  | 60  | NC    |   |
|     | NC    | 61  | 62  | NC    |   |
|     | NC    | 63  | 64  | NC    |   |
|     | NC    | 65  | 66  | NC    |   |
|     | GND   | 67  | 68  | GND   |   |
|     | NC    | 69  | 70  | NC    |   |
|     | NC    | 71  | 72  | NC    |   |
|     | NC    | 73  | 74  | NC    |   |
|     | NC    | 75  | 76  | NC    |   |
|     | NC    | 77  | 78  | NC    |   |
|     | NC    | 79  | 80  | NC    |   |
|     | GND   | 81  | 82  | GND   |   |
| /   | RFU4  | 83  | 84  | RFU3  | / |
| /   | RFU6  | 85  | 86  | RFU5  | / |
| /   | RFU8  | 87  | 88  | RFU7  | / |
| /   | RFU10 | 89  | 90  | RFU9  | / |
| /   | RFU12 | 91  | 92  | RFU11 | / |
| /   | RFU14 | 93  | 94  | RFU13 | / |
|     | GND   | 95  | 96  | GND   |   |
| /   | RFU16 | 97  | 98  | RFU15 | / |
| /   | RFU18 | 99  | 100 | RFU17 | / |
|     | NC    | 101 | 102 | NC    |   |
|     | NC    | 103 | 104 | NC    |   |
|     | NC    | 105 | 106 | NC    |   |
|     | NC    | 107 | 108 | NC    |   |
|     | GND   | 109 | 110 | GND   |   |
|     | GND   | 111 | 112 | GND   |   |
|     | NC    | 113 | 114 | NC    |   |
|     | VCC   | 115 | 116 | VCC   |   |
|     | VCC   | 117 | 118 | VCC   |   |
|     | VCC   | 119 | 120 | VCC   |   |

| JH2                   |            |    |    |            |                       |
|-----------------------|------------|----|----|------------|-----------------------|
| Chassis ground        | Eth_Sheild | 1  | 2  | Eth_Sheild | Chassis ground        |
| Chassis ground        | Eth_Sheild | 3  | 4  | Eth_Sheild | Chassis ground        |
|                       | NC         | 5  | 6  | NC         |                       |
|                       | NC         | 7  | 8  | NC         |                       |
| Gigabit Ethernet port | Port1_T0+  | 9  | 10 | Port2_T0+  | Gigabit Ethernet port |
|                       | Port1_T0-  | 11 | 12 | Port2_T0-  |                       |
|                       | NC         | 13 | 14 | NC         |                       |
|                       | Port1_T1+  | 15 | 16 | Port2_T1+  |                       |
|                       | Port1_T1-  | 17 | 18 | Port2_T1-  |                       |
|                       | NC         | 19 | 20 | NC         |                       |
|                       | Port1_T2+  | 21 | 22 | Port2_T2+  |                       |
|                       | Port1_T2-  | 23 | 24 | Port2_T2-  |                       |
|                       | NC         | 25 | 26 | NC         |                       |

| JH2                  |                |     |     |           |                                   |
|----------------------|----------------|-----|-----|-----------|-----------------------------------|
|                      | Port1_T3+      | 27  | 28  | Port2_T3+ |                                   |
|                      | Port1_T3-      | 29  | 30  | Port2_T3- |                                   |
|                      | NC             | 31  | 32  | NC        |                                   |
|                      | NC             | 33  | 34  | NC        |                                   |
| Test button          | TEST_INPUT_KEY | 35  | 36  | STA_LED-  | Running indicator<br>(active low) |
|                      | GND            | 37  | 38  | GND       |                                   |
| Line decoding signal | A              | 39  | 40  | DCLK      | Shift clock output 1              |
| Line decoding signal | B              | 41  | 42  | DCLK_2    | Shift clock output 2              |
| Line decoding signal | C              | 43  | 44  | LAT       | Latch signal output               |
| Line decoding signal | D              | 45  | 46  | CTRL      | Afterglow control signal          |
| Line decoding signal | E              | 47  | 48  | OE_RED    | Display enable                    |
| Display enable       | OE_BLUE        | 49  | 50  | OE_GREEN  | Display enable                    |
|                      | GND            | 51  | 52  | GND       |                                   |
| /                    | Data2          | 53  | 54  | Data1     | /                                 |
| /                    | Data4          | 55  | 56  | Data3     | /                                 |
| /                    | Data6          | 57  | 58  | Data5     | /                                 |
| /                    | Data8          | 59  | 60  | Data7     | /                                 |
| /                    | Data10         | 61  | 62  | Data9     | /                                 |
| /                    | Data12         | 63  | 64  | Data11    | /                                 |
|                      | GND            | 65  | 66  | GND       |                                   |
| /                    | Data14         | 67  | 68  | Data13    | /                                 |
| /                    | Data16         | 69  | 70  | Data15    | /                                 |
| /                    | Data18         | 71  | 72  | Data17    | /                                 |
| /                    | Data20         | 73  | 74  | Data19    | /                                 |
| /                    | Data22         | 75  | 76  | Data21    | /                                 |
| /                    | Data24         | 77  | 78  | Data23    | /                                 |
|                      | GND            | 79  | 80  | GND       |                                   |
| /                    | Data26         | 81  | 82  | Data25    | /                                 |
| /                    | Data28         | 83  | 84  | Data27    | /                                 |
| /                    | Data30         | 85  | 86  | Data29    | /                                 |
| /                    | Data32         | 87  | 88  | Data31    | /                                 |
| /                    | Data34         | 89  | 90  | Data33    | /                                 |
| /                    | Data36         | 91  | 92  | Data35    | /                                 |
|                      | GND            | 93  | 94  | GND       |                                   |
| /                    | Data38         | 95  | 96  | Data37    | /                                 |
| /                    | Data40         | 97  | 98  | Data39    | /                                 |
| /                    | Data42         | 99  | 100 | Data41    | /                                 |
| /                    | Data44         | 101 | 102 | Data43    | /                                 |
| /                    | Data46         | 103 | 104 | Data45    | /                                 |
| /                    | Data48         | 105 | 106 | Data47    | /                                 |
|                      | GND            | 107 | 108 | GND       |                                   |
|                      | NC             | 109 | 110 | NC        |                                   |
|                      | NC             | 111 | 112 | NC        |                                   |
|                      | NC             | 113 | 114 | NC        |                                   |
|                      | NC             | 115 | 116 | NC        |                                   |
|                      | GND            | 117 | 118 | GND       |                                   |
|                      | GND            | 119 | 120 | GND       |                                   |

#### Note

The recommended VCC power input is 5.0 V.

OE\_RED, OE\_GREEN and OE\_BLUE are display enable pins. When RGB are not controlled separately, use OE\_RED. When the PWM chip is used, those pins are used as GCLK pins.

In the mode of 128 groups of serial data, Data65–Data128 use the data of Data1–Data64, respectively.

## Reference Design for Extended Functions

| Pins for Extended Functions |                              |                              |                                      |
|-----------------------------|------------------------------|------------------------------|--------------------------------------|
| Pin                         | Recommended Smart Module Pin | Recommended Module Flash Pin | Description                          |
| RFU1                        | Reserved                     | Reserved                     | A reserved pin for connection to MCU |
| RFU2                        | Reserved                     | Reserved                     | A reserved pin for connection to MCU |
| RFU3                        | HUB_CODE0                    | HUB_CODE0                    | Flash control pin 1                  |
| RFU4                        | HUB_SPI_CLK                  | HUB_SPI_CLK                  | Clock signal of serial pin           |
| RFU5                        | HUB_CODE1                    | HUB_CODE1                    | Flash control pin 2                  |
| RFU6                        | HUB_SPI_CS                   | HUB_SPI_CS                   | CS signal of serial pin              |
| RFU7                        | HUB_CODE2                    | HUB_CODE2                    | Flash control pin 3                  |
| RFU8                        | /                            | HUB_SPI_MOSI                 | Module Flash data storage input      |
|                             | HUB_UART_TX                  | /                            | Smart module TX signal               |
| RFU9                        | HUB_CODE3                    | HUB_CODE3                    | Flash control pin 4                  |
| RFU10                       | /                            | HUB_SPI_MISO                 | Module Flash data storage output     |
|                             | HUB_UART_RX                  | /                            | Smart module RX signal               |
| RFU11                       | HUB_H164_CSD                 | HUB_H164_CSD                 | 74HC164 data signal                  |
| RFU12                       | /                            | /                            | /                                    |
| RFU13                       | HUB_H164_CLK                 | HUB_H164_CLK                 | 74HC164 clock signal                 |
| RFU14                       | POWER_STA1                   | POWER_STA1                   | Dual power supply detection signal 1 |
| RFU15                       | MS_DATA                      | MS_DATA                      | Dual card backup connection signal   |
| RFU16                       | POWER_STA2                   | POWER_STA2                   | Dual power supply detection signal 2 |
| RFU17                       | MS_ID                        | MS_ID                        | Dual card backup identifier signal   |
| RFU18                       | HUB_CODE4                    | HUB_CODE4                    | Flash control pin 5                  |

### Note

The RFU8 and RFU10 are signal multiplex extension pins. Only one pin from either the Recommended Smart Module Pin or the Recommended Module Flash Pin can be selected at the same time.

## Specifications

|                          |                         |                                                                                                                               |
|--------------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Maximum Loading Capacity | 512 × 512 pixels        |                                                                                                                               |
| Electrical Parameters    | Input voltage           | DC 3.3 V to 5.5 V                                                                                                             |
|                          | Rated current           | 0.5 A                                                                                                                         |
|                          | Rated power consumption | 2.5 W                                                                                                                         |
| Operating Environment    | Temperature             | –20°C to +70°C                                                                                                                |
|                          | Humidity                | 10% RH to 90% RH, non-condensing                                                                                              |
| Storage Environment      | Temperature             | –25°C to +125°C                                                                                                               |
|                          | Humidity                | 0% RH to 95% RH, non-condensing                                                                                               |
| Physical Specifications  | Dimensions              | 80.0 mm × 45.0 mm × 7.9 mm                                                                                                    |
|                          | Net weight              | 22.3 g                                                                                                                        |
| Packing Information      | Packing specifications  | An antistatic bag and anti-collision foam are provided for each receiving card. Each packing box contains 40 receiving cards. |

|                |                        |                                |
|----------------|------------------------|--------------------------------|
|                | Packing box dimensions | 378.0 mm × 190.0 mm × 120.0 mm |
| Certifications | RoHS, EMC Class B      |                                |

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