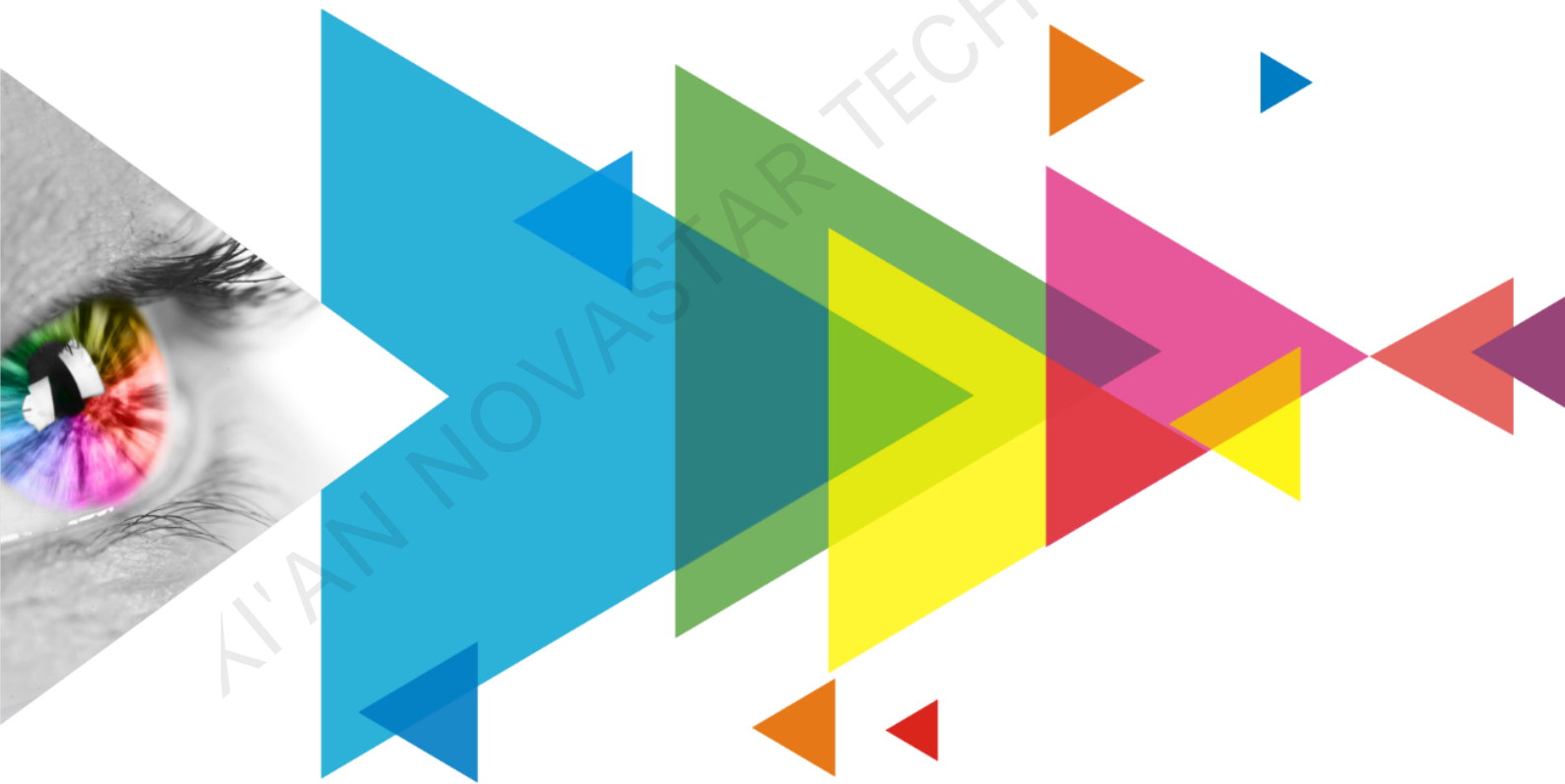


XC160

Receiving Card

V1.2.3



Specifications

Change History

| Document Version | Release Date | Description |
|------------------|--------------|--|
| V1.2.3 | 2020-09-18 | <ul style="list-style-type: none"> Optimized the product introduction. Optimized the feature description. Optimized the legends in the appearance diagram. Optimized the indicator description. Optimized the dimensions diagram. |
| V1.2.2 | 2020-03-19 | Updated the pin diagram. |
| V1.2.1 | 2019-10-31 | Increased the version number only. |
| V1.2.0 | 2019-05-28 | Updated the product picture. |
| V1.1.0 | 2019-04-30 | Updated the indicator status. |
| V1.0.0 | 2018-08-21 | First release |

Introduction

The XC160 is a general small receiving card developed by NovaStar. A single XC160 loads up to 256×256 pixels. Supporting various functions such as pixel level brightness and chroma calibration, quick adjustment of dark or bright lines, and 3D, the XC160 can greatly improve the display effect and user experience.

The XC160 uses DDR2 connector for communication, resulting in good compatibility. It supports up to 32 groups of parallel RGB data or 64 groups of serial data, and is suitable to various on-site setups.

Features

Improvements to Display Effect

- 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 modules and cabinets can be adjusted to improve the visual experience. The adjustment can be easily made and takes effect immediately.
- 3D function
Working with the sending card that supports 3D function, the receiving card supports 3D image output.
- calibration coefficients in the memory of the module to the receiving card.
- 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 receiving card temperature and voltage can be monitored without using peripherals.
- Cabinet LCD
The LCD module of the cabinet can display the temperature, voltage, single run time and total run time of the receiving card.
- Bit error rate monitoring
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.

Improvements to Maintainability

- 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
- Firmware program readback
The receiving card firmware program can be read back and saved to the local computer. NovaLCT V5.2.0 or later is required.

- Configuration parameter readback
The receiving card configuration parameters 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).

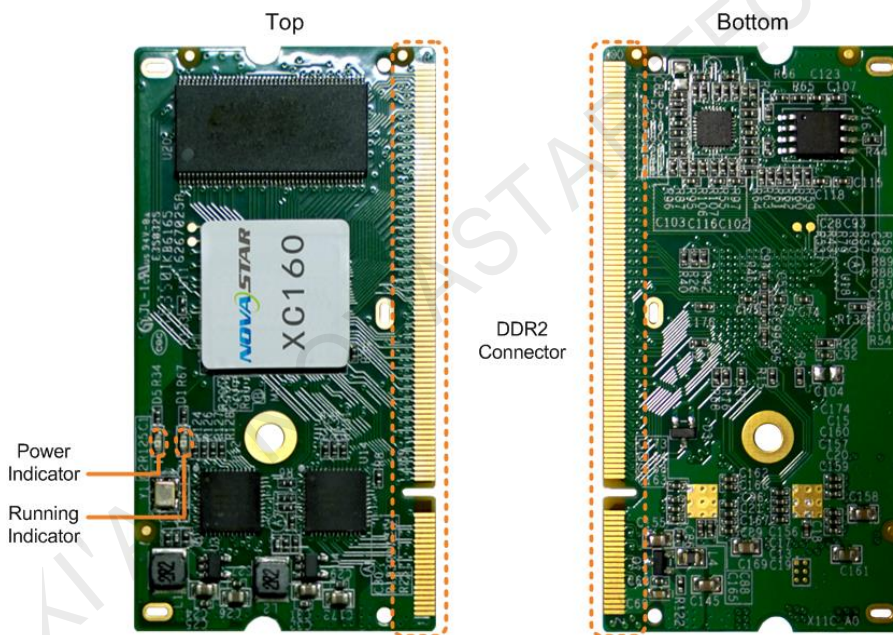
Improvements to Reliability

- 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.

- Status detection of dual power supplies
When two power supplies are connected, their working status can be detected by the receiving card.
- Loop backup
The receiving card and 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.

Appearance



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

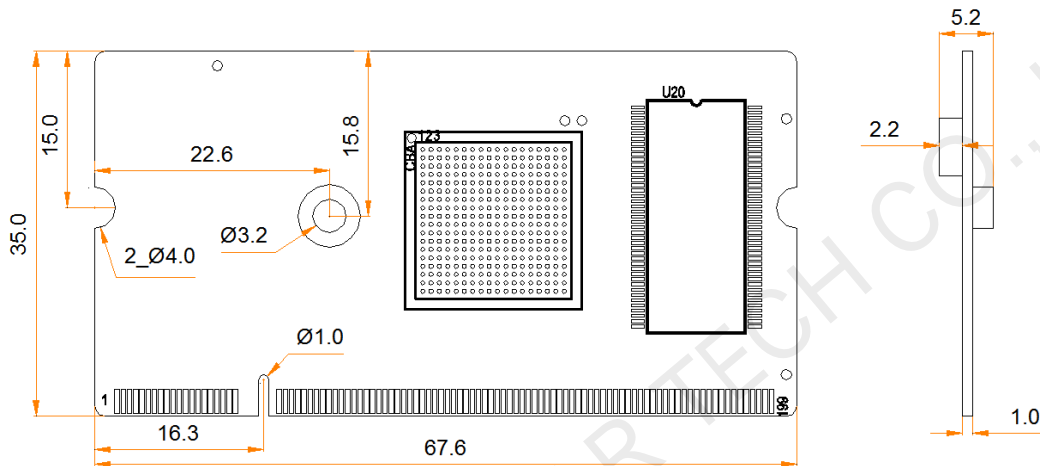
Indicators

| 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. |

| Indicator | Color | Status | Description |
|-----------------|-------|-----------------------------|--|
| | | 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 supply is normal. |

Dimensions

The board thickness is not greater than 1.0 mm, and the total thickness (board thickness + thickness of components on the top and bottom sides) is not greater than 6.0 mm. Ground connection (GND) is enabled for mounting holes.

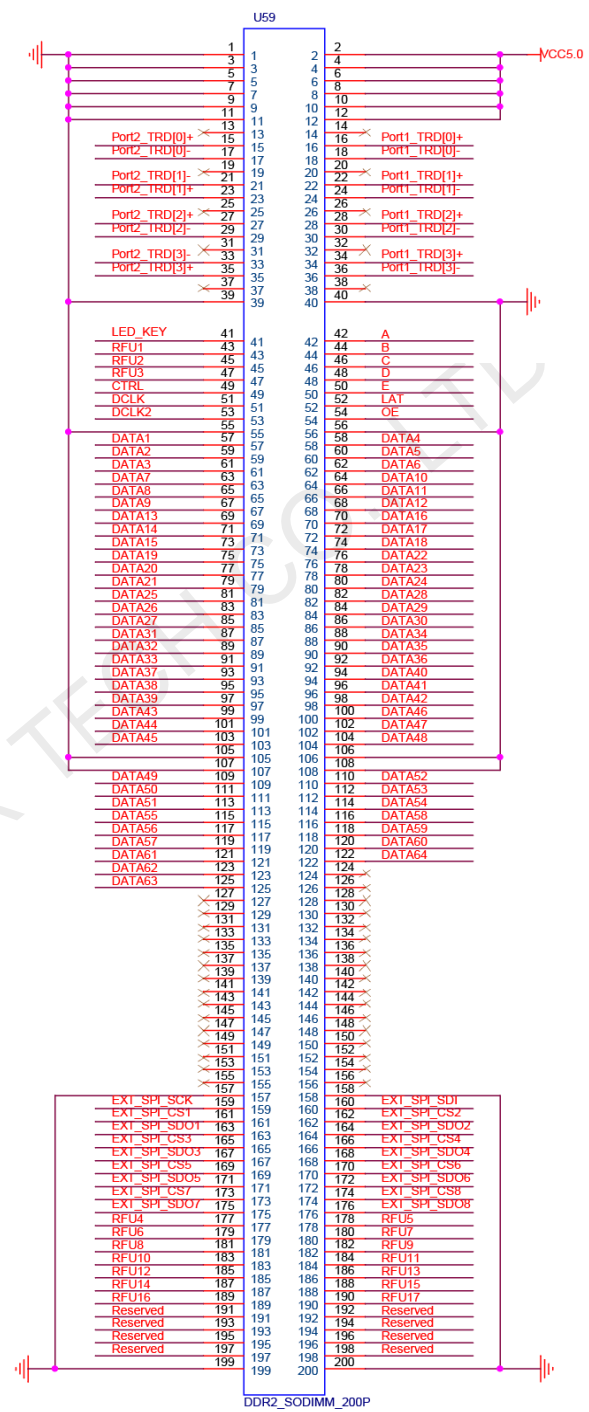
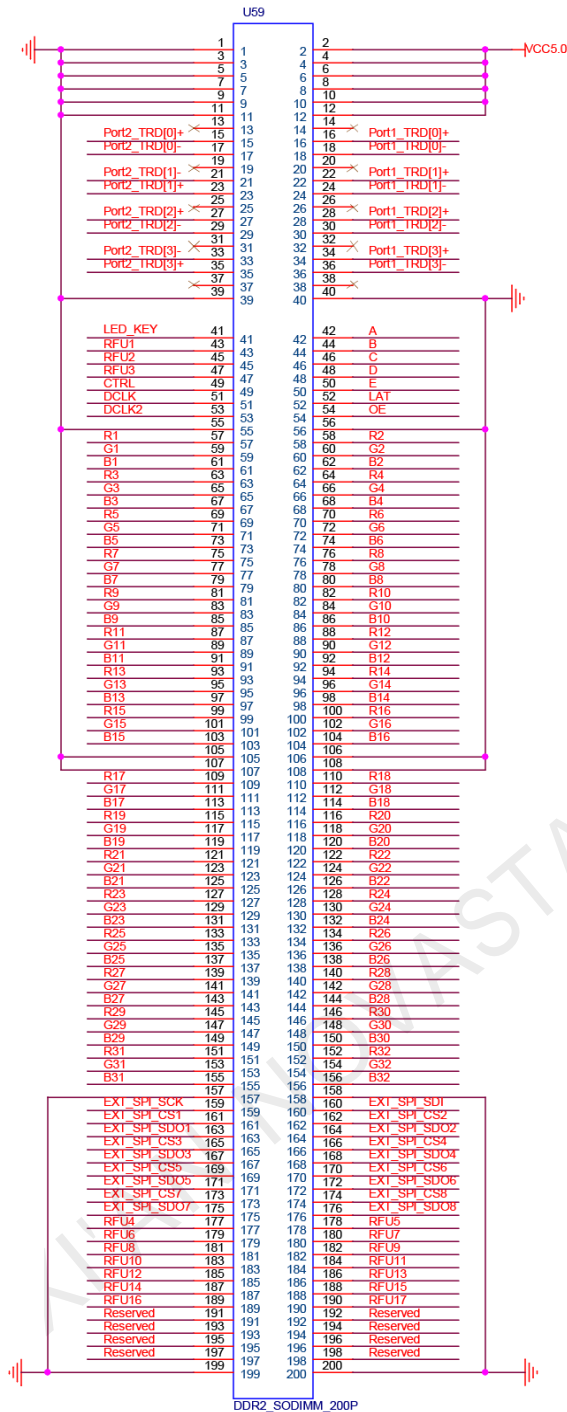


Tolerance: ± 0.1 Unit: mm

Pins

32 groups of parallel RGB data

64 groups of serial data



32 Groups of Parallel RGB Data

| Data Pin Description | | | | | | | |
|----------------------|----|----|---------------|-----|-----|-----|-----|
| GND | 1 | 2 | VCC | G15 | 101 | 102 | G16 |
| GND | 3 | 4 | VCC | B15 | 103 | 104 | B16 |
| GND | 5 | 6 | VCC | GND | 105 | 106 | GND |
| GND | 7 | 8 | VCC | GND | 107 | 108 | GND |
| GND | 9 | 10 | VCC | R17 | 109 | 110 | R18 |
| GND | 11 | 12 | VCC | G17 | 111 | 112 | G18 |
| NC | 13 | 14 | NC | B17 | 113 | 114 | B18 |
| Port2_TRD[0]+ | 15 | 16 | Port1_TRD[0]+ | R19 | 115 | 116 | R20 |

| Data Pin Description | | | | | | | |
|----------------------|----|-----|---------------|--------------|-----|-----|--------------|
| Port2_TRD[0]- | 17 | 18 | Port1_TRD[0]- | G19 | 117 | 118 | G20 |
| GND | 19 | 20 | GND | B19 | 119 | 120 | B20 |
| Port2_TRD[1]- | 21 | 22 | Port1_TRD[1]+ | R21 | 121 | 122 | R22 |
| Port2_TRD[1]+ | 23 | 24 | Port1_TRD[1]- | G21 | 123 | 124 | G22 |
| GND | 25 | 26 | GND | B21 | 125 | 126 | B22 |
| Port2_TRD[2]+ | 27 | 28 | Port1_TRD[2]+ | R23 | 127 | 128 | R24 |
| Port2_TRD[2]- | 29 | 30 | Port1_TRD[2]- | G23 | 129 | 130 | G24 |
| GND | 31 | 32 | GND | B23 | 131 | 132 | B24 |
| Port2_TRD[3]- | 33 | 34 | Port1_TRD[3]+ | R25 | 133 | 134 | R26 |
| Port2_TRD[3]+ | 35 | 36 | Port1_TRD[3]- | G25 | 135 | 136 | G26 |
| NC | 37 | 38 | NC | B25 | 137 | 138 | B26 |
| GND | 39 | 40 | GND | R27 | 139 | 140 | R28 |
| LED_KEY | 41 | 42 | A | G27 | 141 | 142 | G28 |
| RFU1 | 43 | 44 | B | B27 | 143 | 144 | B28 |
| RFU2 | 45 | 46 | C | R29 | 145 | 146 | R30 |
| RFU3 | 47 | 48 | D | G29 | 147 | 148 | G30 |
| CTRL | 49 | 50 | E | B29 | 149 | 150 | B30 |
| DCLK | 51 | 52 | LAT | R31 | 151 | 152 | R32 |
| DCLK2 | 53 | 54 | OE | G31 | 153 | 154 | G32 |
| GND | 55 | 56 | GND | B31 | 155 | 156 | B32 |
| R1 | 57 | 58 | R2 | GND | 157 | 158 | GND |
| G1 | 59 | 60 | G2 | EXT_SPI_SCK | 159 | 160 | EXT_SPI_SDI |
| B1 | 61 | 62 | B2 | EXT_SPI_CS1 | 161 | 162 | EXT_SPI_CS2 |
| R3 | 63 | 64 | R4 | EXT_SPI_SDO1 | 163 | 164 | EXT_SPI_SDO2 |
| G3 | 65 | 66 | G4 | EXT_SPI_CS3 | 165 | 166 | EXT_SPI_CS4 |
| B3 | 67 | 68 | B4 | EXT_SPI_SDO3 | 167 | 168 | EXT_SPI_SDO4 |
| R5 | 69 | 70 | R6 | EXT_SPI_CS5 | 169 | 170 | EXT_SPI_CS6 |
| G5 | 71 | 72 | G6 | EXT_SPI_SDO5 | 171 | 172 | EXT_SPI_SDO6 |
| B5 | 73 | 74 | B6 | EXT_SPI_CS7 | 173 | 174 | EXT_SPI_CS8 |
| R7 | 75 | 76 | R8 | EXT_SPI_SDO7 | 175 | 176 | EXT_SPI_SDO8 |
| G7 | 77 | 78 | G8 | RFU4 | 177 | 178 | RFU5 |
| B7 | 79 | 80 | B8 | RFU6 | 179 | 180 | RFU7 |
| R9 | 81 | 82 | R10 | RFU8 | 181 | 182 | RFU9 |
| G9 | 83 | 84 | G10 | RFU10 | 183 | 184 | RFU11 |
| B9 | 85 | 86 | B10 | RFU12 | 185 | 186 | RFU13 |
| R11 | 87 | 88 | R12 | RFU14 | 187 | 188 | RFU15 |
| G11 | 89 | 90 | G12 | RFU16 | 189 | 190 | RFU17 |
| B11 | 91 | 92 | B12 | Reserved | 191 | 192 | Reserved |
| R13 | 93 | 94 | R14 | Reserved | 193 | 194 | Reserved |
| G13 | 95 | 96 | G14 | Reserved | 195 | 196 | Reserved |
| B13 | 97 | 98 | B14 | Reserved | 197 | 198 | Reserved |
| R15 | 99 | 100 | R16 | GND | 199 | 200 | GND |

64 Groups of Serial Data

| Data Pin Description | | | | | | | |
|----------------------|----|----|---------------|--------|-----|-----|--------|
| GND | 1 | 2 | VCC | DATA44 | 101 | 102 | DATA47 |
| GND | 3 | 4 | VCC | DATA45 | 103 | 104 | DATA48 |
| GND | 5 | 6 | VCC | GND | 105 | 106 | GND |
| GND | 7 | 8 | VCC | GND | 107 | 108 | GND |
| GND | 9 | 10 | VCC | DATA49 | 109 | 110 | DATA52 |
| GND | 11 | 12 | VCC | DATA50 | 111 | 112 | DATA53 |
| NC | 13 | 14 | NC | DATA51 | 113 | 114 | DATA54 |
| Port2_TRD[0]+ | 15 | 16 | Port1_TRD[0]+ | DATA55 | 115 | 116 | DATA58 |
| Port2_TRD[0]- | 17 | 18 | Port1_TRD[0]- | DATA56 | 117 | 118 | DATA59 |
| NC | 19 | 20 | NC | DATA57 | 119 | 120 | DATA60 |
| Port2_TRD[1]- | 21 | 22 | Port1_TRD[1]+ | DATA61 | 121 | 122 | DATA64 |
| Port2_TRD[1]+ | 23 | 24 | Port1_TRD[1]- | DATA62 | 123 | 124 | NC |
| NC | 25 | 26 | NC | DATA63 | 125 | 126 | NC |
| Port2_TRD[2]+ | 27 | 28 | Port1_TRD[2]+ | NC | 127 | 128 | NC |
| Port2_TRD[2]- | 29 | 30 | Port1_TRD[2]- | NC | 129 | 130 | NC |
| NC | 31 | 32 | NC | NC | 131 | 132 | NC |
| Port2_TRD[3]- | 33 | 34 | Port1_TRD[3]+ | NC | 133 | 134 | NC |
| Port2_TRD[3]+ | 35 | 36 | Port1_TRD[3]- | NC | 135 | 136 | NC |
| NC | 37 | 38 | NC | NC | 137 | 138 | NC |
| GND | 39 | 40 | GND | NC | 139 | 140 | NC |

| Data Pin Description | | | | | | | |
|----------------------|----|-----|--------|--------------|-----|-----|--------------|
| LED_KEY | 41 | 42 | A | NC | 141 | 142 | NC |
| RFU1 | 43 | 44 | B | NC | 143 | 144 | NC |
| RFU2 | 45 | 46 | C | NC | 145 | 146 | NC |
| RFU3 | 47 | 48 | D | NC | 147 | 148 | NC |
| CTRL | 49 | 50 | E | NC | 149 | 150 | NC |
| DCLK | 51 | 52 | LAT | NC | 151 | 152 | NC |
| DCLK2 | 53 | 54 | OE | NC | 153 | 154 | NC |
| GND | 55 | 56 | GND | NC | 155 | 156 | NC |
| DATA1 | 57 | 58 | DATA4 | GND | 157 | 158 | GND |
| DATA2 | 59 | 60 | DATA5 | EXT_SPI_SCK | 159 | 160 | EXT_SPI_SDI |
| DATA3 | 61 | 62 | DATA6 | EXT_SPI_CS1 | 161 | 162 | EXT_SPI_CS2 |
| DATA7 | 63 | 64 | DATA10 | EXT_SPI_SDO1 | 163 | 164 | EXT_SPI_SDO2 |
| DATA8 | 65 | 66 | DATA11 | EXT_SPI_CS3 | 165 | 166 | EXT_SPI_CS4 |
| DATA9 | 67 | 68 | DATA12 | EXT_SPI_SDO3 | 167 | 168 | EXT_SPI_SDO4 |
| DATA13 | 69 | 70 | DATA16 | EXT_SPI_CS5 | 169 | 170 | EXT_SPI_CS6 |
| DATA14 | 71 | 72 | DATA17 | EXT_SPI_SDO5 | 171 | 172 | EXT_SPI_SDO6 |
| DATA15 | 73 | 74 | DATA18 | EXT_SPI_CS7 | 173 | 174 | EXT_SPI_CS8 |
| DATA19 | 75 | 76 | DATA22 | EXT_SPI_SDO7 | 175 | 176 | EXT_SPI_SDO8 |
| DATA20 | 77 | 78 | DATA23 | RFU4 | 177 | 178 | RFU5 |
| DATA21 | 79 | 80 | DATA24 | RFU6 | 179 | 180 | RFU7 |
| DATA25 | 81 | 82 | DATA28 | RFU8 | 181 | 182 | RFU9 |
| DATA26 | 83 | 84 | DATA29 | RFU10 | 183 | 184 | RFU11 |
| DATA27 | 85 | 86 | DATA30 | RFU12 | 185 | 186 | RFU13 |
| DATA31 | 87 | 88 | DATA34 | RFU14 | 187 | 188 | RFU15 |
| DATA32 | 89 | 90 | DATA35 | RFU16 | 189 | 190 | RFU17 |
| DATA33 | 91 | 92 | DATA36 | Reserved | 191 | 192 | Reserved |
| DATA37 | 93 | 94 | DATA40 | Reserved | 193 | 194 | Reserved |
| DATA38 | 95 | 96 | DATA41 | Reserved | 195 | 196 | Reserved |
| DATA39 | 97 | 98 | DATA42 | Reserved | 197 | 198 | Reserved |
| DATA43 | 99 | 100 | DATA46 | GND | 199 | 200 | GND |

Specifications

| | | |
|---------------------------|-------------------------|---|
| Maximum Loading Capacity | 256 × 256 pixels | |
| Electrical Specifications | 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 | 67.6 mm × 35.0 mm × 5.2 mm |
| | Net weight | 10.7 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 | |

The amount of current and power consumption may vary depending on factors such as product settings, usage, and environment.

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