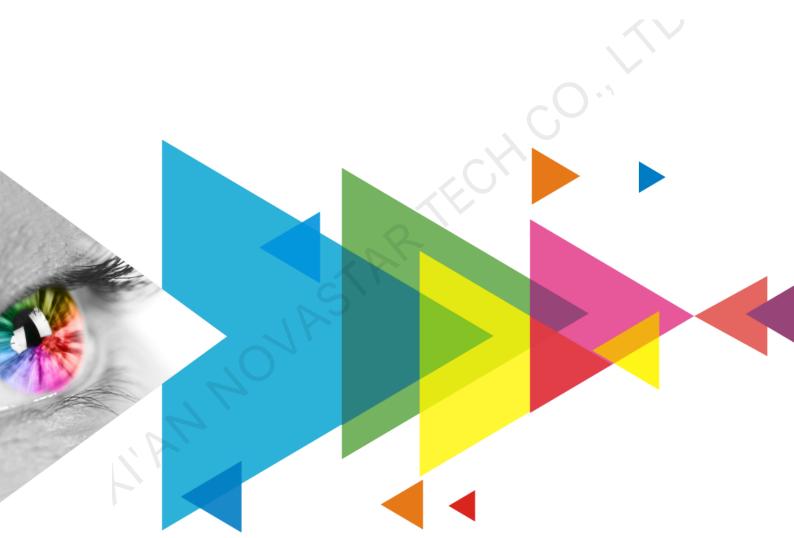


# A10s Pro

# **Receiving Card**



**Specifications** 

## Change History

Document Version	Release Date	Description
V1.1.2	2022-02-28	Added the dimensions diagram description.
		Updated the certifications description.
		Updated some feature descriptions.
V1.1.1	2021-08-10	Updated the product introduction.
		Updated the description of Dynamic Booster, Full-Grayscale
		Calibration and HDR functions.
V1.1.0	2021-07-30	Updated the appearance diagram.
		Updated the feature description.
V1.0.0	2021-06-03	First release

### Introduction

The A10s Pro is a fully-featured high-end small receiving card developed by NovaStar. A single A10s Pro supports resolutions up to 512x512@60Hz. It supports the exclusive Dynamic Booster, Full-Grayscale Calibration and Image Booster technologies of NovaStar. The Dynamic Booster can significantly improve the display contrast. The Full-Grayscale Calibration can make the display brightness and chroma more uniform at different grayscale levels. The Image Booster can precisely calibrate the display color gamut and grayscale and improve the grayscale by 64 times.

The A10s Pro also supports the pixel level brightness and chroma calibration, quick adjustment of dark or bright lines, low latency, 3D, individual gamma adjustment for RGB, image rotation in 90° increments, image rotation at any angle, 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 Pro 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 Pro has improved electromagnetic compatibility and is suitable for various on-site setups that have high requirements.

### **Certifications**

RoHS, EMC Class B

If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please contact NovaStar to confirm or address the problem. Otherwise, the customer shall be responsible for the legal risks caused or NovaStar has the right to claim compensation.

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### **Features**

### Improvements to Display Effect

- Dynamic Booster
   Significantly improve the display contrast and
   image details for better visual experience and
   effectively control and lower the display power
   consumption.
- Full-Grayscale Calibration
   Each grayscale level of the input source has its
   own unique calibration coefficients, which can
   achieve uniform display brightness and chroma
   in high brightness, medium grayscale, and low
   grayscale at the same time.
- HDR function
   HDR10 and HLG are supported.

Work with the sending card that supports the HDR function to correctly parse the HDR video source and faithfully reproduce the original brightness range and color space, allowing for a more lifelike image.

- Image Booster
   The Image Booster has the following 3 functions that improve the display effect (the actual effect depends on the driver IC) from different dimensions.
  - Color Management: Allow users to freely switch the color gamut of the screen between different gamuts in real time 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 V5.4.0 or later is required.

Pixel level brightness and chroma calibration
 Work with NovaStar's high-precision calibration
 system to calibrate the brightness and chroma of

- each pixel, effectively removing brightness differences and chroma differences, and enabling high brightness consistency and chroma consistency.
- Quick adjustment of dark or bright lines
   The dark or bright lines caused by splicing of
   modules or cabinets can be adjusted to improve
   the visual experience. The adjustment is easy
   and 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 sending card that supports 3D function, the receiving card supports 3D output.
- Individual gamma adjustment for RGB Working with NovaLCT (V5.2.0 or later) and the sending card that supports this function, the receiving card supports individual adjustment of red gamma, green gamma and blue gamma, which can effectively control image nonuniformity at low grayscale conditions 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 SmartLCT and the MCTRL R5 LED
   display controller, the receiving card supports
   image rotation at any angle.

#### Improvements to Maintainability

- Automatic module calibration
   After a new module with flash memory is installed to replace the old one, the calibration coefficients stored in the memory can be automatically uploaded to the receiving card when it is powered on.
- Quick uploading of calibration coefficients
   Upload the calibration coefficients quickly to the receiving cards to improve efficiency.

- 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 in module Flash
   For modules with flash memory, when the Ethernet cable is disconnected, users can hold down the self-test button on the cabinet to upload the calibration coefficients in the memory of the module to the receiving card.
- Mapping function
   The cabinets can display the sending card number, Ethernet port number and receiving card number, 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 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.
- Bite 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 used, their
   working status can be detected by the receiving
- 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. When the
primary receiving card fails, the backup card can
serve immediately to ensure uninterrupted
operation of the display.

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

- Loop backup The receiving card and sending card form a loop via the primary and backup line connections. When 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 program backup
   Two copies of firmware program are stored in
   the application area of the receiving card at the
   factory to avoid the problem that the receiving
   card may get stuck abnormally during program
   update.
- 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**







#### **Bottom**



High-Density Connectors

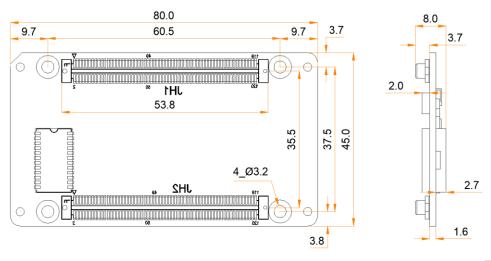
All product pictures shown in this document are for illustration purpose only. Actual product may vary.

### **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.
	1	Flashing once every 0.2s	The receiving card failed to load the program in the application area and is now using the backup program.
, P		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: ±0.3 Unit: mm



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

To make molds or trepan mounting holes, please contact NovaStar for a higher-precision structural drawing.

# **Pins**

### **32 Groups of Parallel Data**

	JH1					JH2		
GND 1	. 2	GND		Eth_Sheild	1	4 0	2	Eth_Sheild
× 3	1 2 4 X			Eth_Sheild	3	1 2 3 4	4	Eth_Sheild
<u> </u>	5 6 6 X				× 5	5 6	6 8	
× ′ 9	7 8 10 ×			Port1 T0+	× ′ 9	7 8	10 ×	Port2 T0+
₹ 11	9 10 12 ×			Port1_T0-	11	9 10	12	Port2_T0-
	11 12 14 X 13 14 16 X		-		<sub>V</sub> 13	11 12 13 14	14 16 ×	
RFU1 2 15	15 16 10 7			Port1_T1+	^ 15 17	15 16	10	Port2_T1+
RFU1 ^ 17 RFU2 19	17 18 18 ×		-	Port1_T1-	. 19	17 18	18 20	Port2_T1-
GND 21	19 20 22 ×			Port1 T2+	× 13	19 20	22 ×	Port2 T2+
× 23	21 22 <u>24</u> × 23 24 3e ×			Port1_T2-	23	21 22 23 24	24	Port2_T2-
GND 1 25	25 26 20	GND		Dortd TO	× 25	25 26	26 X	Dorto Tai
G17 27 R18 29	27 28 28	R17 B17		Port1_T3+ Port1_T3-	^ 27 29	27 28	28 ^ 30	Port2_T3+ Port2_T3-
B18 31	29 30 32	G18		FORT_10-	31	29 30	32	1012_10-
G19 33	31 32 34 33 34 36	R19		STA_LEDB-		31 32 33 34	34 ×	STA_LEDR-
R20 35	25 26 30	B19			IN 35	33 34 35 36	36	STA_LEDG-
B20 37 GND 39	37 38 <u>38</u> 37 38 <u>40</u>	G20 GND		GND	37 39	37 38	38 40	GND DCLK1
G21 41	39 40 42	R21		A B	41	39 40	42	DCLK1
R22 43	41 42 44	B21		C	43	41 42	44	LAT
B22 45	43 44 46 45 46 48	G22		D	45	43 44 45 46	46	CTRL
G23 47	47 48 40	R23		E	47	47 48	48	OE_R
R24 49 B24 51	49 50 50	B23 G24		OE_B GND	49 51	49 50	50 52	OE_G GND
GND 53	51 52 54	GND		G1	53	51 52	54	R1
G25 55	53 54 56	R25		R2	55	53 54	56	B1
R26 57	55 56 58 57 58 60	B25		B2	57	55 56 57 58	58	G2
B26 59	E0 60 60	G26		G3	59	59 60	60	R3
G27 61 R28 63	61 62 64	R27 B27		R4 B4	61 63	61 62	62 64	B3 G4
B28 65	63 64 66	G28		GND	65	63 64	66	GND
GND 67	65 66 68	GND	•	G5	67	65 66	68	R5
G29 69	67 68 70 69 70 73	R29		R6	69	67 68 69 70	70	B5
R30 71	74 70 /2	B29		B6	71	71 72	72	G6
B30 73 G31 75	73 74 76	G30 R31		<u>G7</u> R8	73 75	73 74	74 76	R7 B7
R32 77	75 76 <del>78</del>	B31		B8	77	75 76	78	G8
B32 79	77 78 80	G32		GND	79	77 78	80	GND
GND 81	79 80 82 81 82 84	GND		G9	81	79 80	82	R9
RFU4 83	92 94 04	RFU3		R10	83	81 82 83 84	84	B9
RFU6 85	85 86 88	RFU5		B10	85 87	85 86	86 88	G10
RFU8 87 RFU10 89	87 88 90	RFU7 RFU9		G11 R12	89	87 88	90	R11 B11
RFU12 91	89 90 92	RFU11		B12	91	89 90	92	G12
RFU14 93	91 92 94	RFU13		GND	93	91 92	94	GND
GND 95	05 00 90	GND		G13	95	93 94 95 96	96	R13
RFU16 97	07 00 96	RFU15		R14	97	97 98	98	B13
RFU18 99	99 100 102	RFU17		B14 G15	99 101	99 100	100 102	G14 R15
× 101	101102 104		-	R16	103	101102	104	B15
105	103104 106			B16	105	103104	106	G16
2 107	105106 108 × 107108 110			GND	107	105106 107108	108	GND
GND 109	100110	GND	_		× 109	107108	110 ×	
GND 111 , 113	111112 114	GND	_		€ 111 € 113	111112	112 Q 114 Q	
× 115	113114 116 X				× 115	113114	116 X	
117	115116 118	$\neg$		GND	× 117	115116	118 ×	GND
119	117118 120 119120			GND	119	117118	120	GND
J	119120	_				119120		
EXT_5V		EXT_5V						

	JH1									
	GND	1	2	GND						
	NC	3	4	NC						
	NC	5	6	NC						
	NC	7	8	NC						
	NC	9	10	NC						
	NC	11	12	NC						
	NC	13	14	NC						
	NC	15	16	NC						
/	RFU1	17	18	NC						
/	RFU2	19	20	NC						

JH1								
	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				
/	G21	41	42	R21	/			
/	R22	43	44	B21	/			
/	B22	45	46	G22	/			
/	G23	47	48	R23	/			
/	R24	49	50	B23	1			
/	B24	51	52	G24	7 1 1			
·	GND	53	54	GND				
/	G25	55	56	R25	1			
1	R26	57	58	B25	1			
/	B26	59	60	G26	1			
1	G27	61	62	R27	1			
1	R28	63	64	B27	/			
/	B28	65	66	G28	/			
,	GND	67	68	GND	,			
1	G29	69	70	R29	1			
/	R30	71	72	B29	/			
/	B30	73	74	G30	/			
1	G31	75	76	R31	/			
/	R32	77	78	B31	/			
/	B32	79	> 80	G32	/			
,	GND	81	82	GND	,			
/	RFU4	83	84	RFU3	/			
1	RFU6	85	86	RFU5	/			
/	RFU8	87	88	RFU7	/			
1	RFU10	89	90	RFU9	/			
/	RFU12	91	92	RFU11	/			
/	RFU14	93	94	RFU13	/			
,	GND	95	96	GND	,			
1	RFU16	97	98	RFU15	/			
,	RFU18	99	100	RFU17	/			
,	NC NC	101	102	NC	,			
	NC NC	103	104	NC NC				
	NC NC	105	106	NC NC				
	NC NC	107	108	NC NC				
	GND	109	110	GND				
	GND	111	112	GND				
	NC NC	113	114	NC				
	EXT_5V	115	116	EXT_5V				
	EXT_5V	117	118	EXT_5V				
	EXT_5V	117	120	EXT_5V				
	EXI_3V	119	120	EXT_3V				

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					
Cicabit Ethamat part	Port1_T0+	9	10	Port2_T0+	Cigabit Etharnat part				
Gigabit Ethernet port	Port1_T0-	11	12	Port2_T0-	Gigabit Ethernet port				

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		JH2	)		
	NC	13	14	NC	
	Port1_T1+	15	16	Port2_T1+	
	Port1_T1-	17	18	Port2_T1-	
	NC 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-	
	NC	31	32	NC	
Tri-color LED (Reserved)	STA_LEDB-	33	34	STA_LEDR-	Tri-color LED (Reserved)
Test button	Input_KEY_IN	35	36	STA_LEDG-	Running indicator (active low) Tri-color LED (Reserved)
	GND	37	38	GND	
Line decoding signal	А	39	40	DCLK1	Shift clock output 1
Line decoding signal	В	41	42	DCLK2	Shift clock output 2
Line decoding signal	С	43	44	LAT	Latch signal output
Line decoding signal	D	45	46	CTRL	Afterglow control signal
Line decoding signal	Е	47	48	OE_R	Display enable signal
Display enable signal	OE_B	49	50	OE_G	Display enable signal
	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	/
1	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	I
	GND	107	108	GND	
	NC NC	109	110	NC NC	
	NC NC	111	112	NC NC	
	NC NC	113	114	NC NC	
	GND	115 117	116 118	GND	
	GND	117	110	GND	

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	JH2	2		
GND	119	120	GND	

### 64 Groups of Serial Data

			JH1							JH2		
GND	1			2	GND		Eth Sheild	1 [			2	Eth Sheild
OND	<u> 3</u>	1	2	4	,		Eth Sheild	3	1	2	4	Eth_Sheild
		3 5	4 6	6		•		5	3 5	4 6	6	
	ŷ 7	7	8	8	}		<del>2</del>	7	7	8	8 🗘	D 10 TO
	<del>2 9</del> 11 €	9	10	10 (	(		Port1_T0+ Port1_T0-	9 11	9	10	10 ^ 12	Port2_T0+ Port2_T0-
	× 13	11	12	14			FOILT_TO-	13	11	12	14	FUILZ_TU-
	<del>× 15</del>	13	14	16			Port1 T1+ X	15	13	14	16 ×	Port2 T1+
RFU1	× 17	15 17	16 18	18 🖔			Port1_T1-	17	15 17	16 18	18	Port2_T1-
RFU2	19	19	20	20 (			Dortt TO: X	19	19	20	20 ×	D 10 TO
GND	21	21	22	22 ^			Port1_T2+ ^	21 23	21	22	22 ^ 24	Port2_T2+ Port2_T2-
GND	$\times \frac{23}{25}$	23	24	26 ×	GND		FOILI_12-	25	23	24	26	PUILZ_1Z-
Data50	27	25	26	28	Data49	_	Port1 T3+ X	27	25	26	28	Port2 T3+
Data52	29	27 29	28 30	30	Data51		Port1_T3-	29	27 29	28 30	30	Port2_T3-
Data54	31	31	32	32	Data53	_	~ ×	31	31	32	32 ×	Z-, \-\-
Data56	33 35	33	34	34 36	Data55	_	STA_LEDB-	33	33	34	34 ^	STA_LEDR-
Data58 Data60	35	35	36	38	Data57 Data59		Input_KEY_IN GND	35 37	35	36	38	STA_LEDG- GND
GND	39	37	38	40	GND	<del>-</del>	A	39	37	38	40	DCLK1
Data62	41	39	40	42	Data61		B	41	39	40	42	DCLK2
Data64	43	41 43	42 44	44	Data63		С	43	41 43	42 44	44	LAT
NC NC	45	45	46	46	NC NC		D	45	45	46	46	CTRL
NC NC	47 49	47	48	48 50	NC NC	_	E OE B	47 49	47	48	_48 50	OE_R OE G
NC NC	51	49	50	52	NC NC		GND	51	49	50	52	GND
GND	53	51	52	54	GND	_	Data2	53	51	52	54	Data1
NC	55	53 55	54 56	56	NC	_	Data4	55	53 55	54 56	56	Data3
NC NC	57	57	58	58	NC	_	Data6	57	57	58	58	Data5
NC NC	59 61	59	60	60 62	NC NC		Data8 Data10	59 61	59	60	60 62	Data7 Data9
NC NC	63	61	62	64	NC NC	_	Data 10	63	61	62	64	Data11
NC	65	63	64	66	NC		GND	65	63	64	66	GND
GND	67	65 67	66 68	68	GND		Data14	67	65 67	66 68	68	Data13
NC NC	69 71	69	70	70	NC NC	-	Data16	69	69	70	70	Data15
NC NC	73	71	72	72 74	NC NC	-	Data18 Data20	71 73	71	72	72 74	Data17 Data19
NC NC	75	73	74	76	NC NC		Data22	75	73	74	76	Data 21
NC	77	75	76	78	NC		Data24	77	75	76	78	Data23
NC	79	77 79	78 80	80	NC		GND	79	77 79	78 80	80	GND
GND	81	81	82	82	GND	<u>.</u>	Data26	81	81	82	82	Data25
RFU4 RFU6	83 85	83	84	84 86	RFU3 RFU5	_	Data28 Data30	83 85	83	84	84 86	Data27 Data29
RFU8	87	85	86	88	RFU7	-	Data32	87	85	86	88	Data31
RFU10	89	87	88	90	RFU9	_	Data34	89	87	88	90	Data33
RFU12	91	89 91	90 92	92	RFU11		Data36	91	89 91	90 92	92	Data35
RFU14	93 95	93	94	94 96	RFU13	_	GND Dete 28	93 95	93	94	94 96	GND Dete37
GND RFU16	95	95	96	98	GND RFU15		Data38 Data40	97	95	96	98	Data37 Data39
RFU18	99	97	98	100	RFU17	-	Data42	99	97	98	100	Data41
	, 101		100	102	,	_	Data44	101		100	102	Data43
	2 103		1102 3104	104 🔾			Data46	103		102 104	104	Data45
	105		5106	106			Data48	105		106	106	Data47
GND	2 107 109		7108	108 X	GND		GND	107 109		108	108 110	GND
GND	111	109	9110	112	GND		×	111	109	110	112 ×	
	× 113		1112	114	,		<del>&gt;</del>	113		112	114 💸	
	115		3114 5116	116 ^			<u>~</u>	115		114 116	116 🗘	
	117		7118	118	<b>→</b>		GND ^	117		118	118 ^	GND
	119		9120	120	<del></del>		GND	119		120	120	GND
											l	
EXT_5V					EXT_5V							

	JH1									
	GND	1	2	GND						
	NC	3	4	NC						
	NC	5	6	NC						
	NC	7	8	NC						
	NC	9	10	NC						
	NC	11	12	NC						
	NC	13	14	NC						
	NC	15	16	NC						
/	RFU1	17	18	NC						

		Jŀ	11		
1	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	
1	Data54	33	34	Data55	
/	Data58	35	36	Data57	
/	Data60	37	38	Data59	
,	GND	39	40	GND	<u> </u>
1	Data62	41	42	Data61	1
/	Data64	43	44	Data63	
,	NC	45	46	NC	,
	NC NC			NC NC	
	NC NC	47	48	NC NC	
		49	50		
	NC CND	51	52	NC CND	*
	GND	53	54	GND	. 7
	NC 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 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	
1	RFU10	89	90	RFU9	
	RFU12	91	92	RFU11	
1	RFU14	93	94	RFU13	/
	GND	95	96	GND	,
1	RFU16	97	98	RFU15	
/	RFU18	99	100	RFU17	/
	NC NC	101	102	NC NC	
	NC NC	103	104	NC NC	
	NC NC	105	106	NC NC	
	NC CNID	107	108	NC CNID	
	GND	109	110	GND	
	GND	111	112	GND	
	NC	113	114	NC	
	EXT_5V	115	116	EXT_5V	
	EXT_5V	117	118	EXT_5V	
	EXT_5V	119	120	EXT_5V	

JH2

			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	
	Port1_T0+	9	10	Port2_T0+	
	Port1_T0-	11	12	Port2_T0-	
	NC	13	14	NC	
	Port1_T1+	15	16	Port2_T1+	
	Port1_T1-	17	18	Port2_T1-	
Gigabit Ethernet port	NC	19	20	NC	Gigabit Ethernet port
	Port1_T2+	21	22	Port2_T2+	
	Port1_T2-	23	24	Port2_T2-	
	NC	25	26	NC	
	Port1_T3+	27	28	Port2_T3+	7 \ 1
	Port1_T3-	29	30	Port2_T3-	
	NC	31	32	NC	
Tri-color LED (Reserved)	STA_LEDB-	33	34	STA_LEDR-	Tri-color LED (Reserved)
Test button	Input_KEY_IN	35	36	STA_LEDG-	Running indicator (active low) Tri-color LED (Reserved)
	GND	37	38	GND	
Line decoding signal	Α	39	40	DCLK1	Shift clock output 1
Line decoding signal	В	41	42	DCLK2	Shift clock output 2
Line decoding signal	С	43	44	LAT	Latch signal output
Line decoding signal	D	45	46	CTRL	Afterglow control signal
Line decoding signal	Е	47	48	OE_R	Display enable signal
Display enable signal	OE_B	49	50	OE_G	Display enable signal
	GND	51	52	GND	
1	Data2	53	54	Data1	/
1	Data4	55	56	Data3	/
1	Data6	57	58	Data5	/
1	Data8	59	60	Data7	/
1	Data10	61	62	Data9	/
1	Data12	63	64	Data11	/
	GND	65	66	GND	
1	Data14	67	68	Data13	/
1	Data16	69	70	Data15	/
	Data18	71	72	Data17	/
	Data20	73	74	Data19	1
	Data22	75	76	Data21	/
1	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	/

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JH2					
	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 power input is 5.0 V.

OE\_R, OE\_G and OE\_B are display enable signals. When RGB are not controlled separately, use OE\_R. When the PWM chip is used, they are used as GCLK signals.

In the mode of 128 groups of serial data, Data65–Data128 are multiplexed into Data1–Data64.

## **Reference Design for Extended Functions**

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

# **Specifications**

Maximum Resolution	512×512@60Hz		
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	Temperature	-25°C to +125°C	

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Environment	Humidity	0% RH to 95% RH, non-condensing
Physical Specifications	Dimensions	80.0 mm × 45.0 mm × 8.0 mm
	Net weight	22.8 g
Packing Packing specifications Information		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

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

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