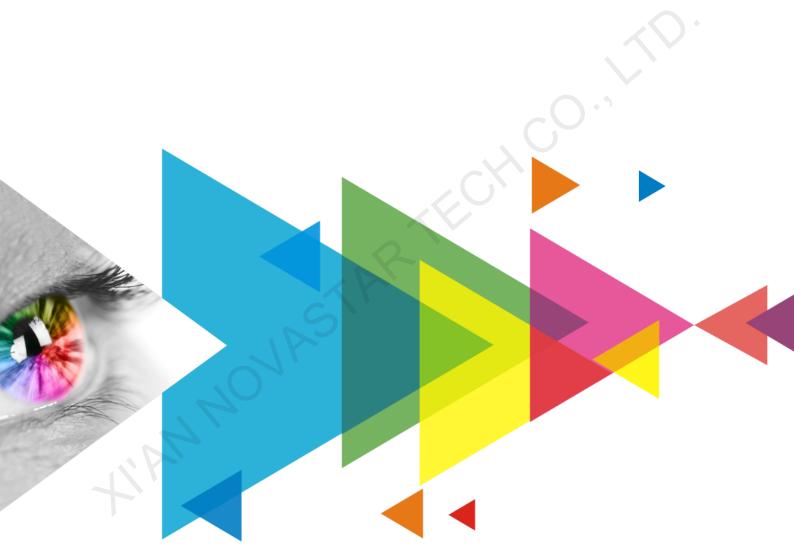


# A10s Pro

# **Receiving Card**



**Specifications** 

# **Change History**

Document Version	Release Date	Description
V1.1.1	2021-08-10	<ul> <li>Updated the product introduction.</li> <li>Updated the description of Dynamic Booster, Full-Grayscale Calibration and HDR functions.</li> </ul>
V1.1.0	2021-07-30	<ul><li>Updated the appearance diagram.</li><li>Updated the feature description.</li></ul>
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 loads up to 512x512 pixels. It supports the exclusive Dynamic Booster, Full-Grayscale Calibration and LED 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 LED 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.

### **Features**

#### **Improvements to Display Effect**

- Dynamic Booster
   Working with the VMP control software and
   MX40 PRO LED display controller, the receiving
   card can significantly improve the display
   contrast to offer better visual experience and
   effectively control and lower the display power
   consumption.
- Full-Grayscale Calibration

The calibration can make the display brightness and chroma more uniform at different grayscale levels and improve the display image quality, especially the indoor fine-pitch displays.

Sending devices that support this function: MX40 PRO, MCTRL4K, MCTRL1600, MCTRL600, H15, H9, H5, H2 and V1260.

HDR function
 HDR10 and HLG video sources are supported.

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

When the receiving card works with the MX40 PRO, the capacity of loading HDR images will not be halved.

- LED Image Booster
   The LED 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: 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 V5.4.0 or later is required.

- Pixel level brightness and chroma calibration
  Working with NovaLCT and calibration platform
  (CalCube MiniLED V1.1.0 or later
  recommended), the receiving card supports
  brightness and chroma calibration on each LED,
  which can effectively remove color differences
  and chroma differences and greatly improve
  display brightness consistency 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 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 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**





Indicator

**Bottom** 



High-Density Connectors

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

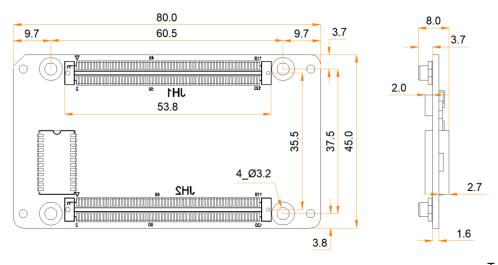
## **Indicators**

Indicator

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 4	Flashing once every 0.2s	The receiving card failed to load the program in the application area and is now using the backup program.		
, D		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.

PAGE

# **Pins**

## 32 Groups of Parallel Data

			JH1							J	H2		
GND	1	4	2	2	GND	_		Eth_Sheild	1 1		2	2	Eth_Sheild
×	3	1	2	4 ×				Eth_Sheild	3		4	4	Eth_Sheild
X	5 7	5	6	6 Ŷ				X-	5 7 5		6	6 8 ×	
×	9	7	8	10				Port1_T0+ X	g 7		8	10 ×	Port2 T0+
×	11	9	10	12 💸				Port1_T0- 1	1 9		0	12	Port2_T0-
Ç	13	11 13	12 14	14 🗘					3 1 5 1		2 4	14 16 ×	
RFU1 $\widehat{X}$	15 17	15	16	16 🗘				Port1_T1+ ^ 1 Port1_T1- 1	ړ د		6	16 ^ 18	Port2_T1+ Port2_T1-
RFU2	19	17	18	20 💥			_	POILI_11- 1		7 1	8	20	PORZ_TT-
GND	21	19	20	22 💢				Port1_T2+ × 2	1 1		0	22 ×	Port2_T2+
X X	23	21 23	22 24	24 ×				Port1_T2- 2			2	24	Port2_T2-
GND	25	25	26	20	GND R17	_			2 2		6	26 X	Dort2 T2+
G17 R18	27 29	27	28	28 30	B17	_	_	Port1_T3+ ^ 2 Port1_T3- 2	2	7 2	8	28 ^ 30	Port2_T3+ Port2_T3-
B18	31	29	30	32	G18	_		. 3	1 2		0	32	1 6/42 10
G19	33	31 33	32 34	34	R19	_		STA_LEDB- ^ 3			2	34 ^	STA_LEDR-
R20	35	35	36	36	B19	_		Input_KEY_IN 3	<u> </u>		6	36	STA_LEDG-
B20 GND	37 39	37	38	38 40	G20 GND	_		GND 3	/ 2		8	38 40	GND DCLK1
G21	41	39	40	42	R21	_	_	B 4	1 3		0	42	DCLK2
R22	43	41	42	44	B21	_			3 4		2	44	LAT
B22	45	43 45	44 46	46	G22	_		D 4			4 6	46	CTRL
G23 R24	47 49	47	48	48 50	R23	_		E 4	9 4		8	48 50	OE_R OE G
B24	51	49	50	52	B23 G24	_	_		1 4		0	52	GND
GND	53	51	52	54	GND	_			3 5		2	54	R1
G25	55	53 55	54 56	56	R25	_		R2 5			4 6	56	B1
R26	57	57	58	58	B25	_		B2 5	/		8	58	G2
B26 G27	59 61	59	60	60 62	G26 R27	_	_	G3 5	9 _		0	60 62	R3 B3
R28	63	61	62	64	B27	_			3 6		2	64	G4
B28	65	63	64	66	G28	_		GND 6	5 6		4	66	GND
GND	67	65 67	66 68	68	GND	_		G5 6			6 8	68	R5
G29 R30	69 71	69	70	70	R29 B29	_	$\rightarrow$		9 6		o'	70	<u>B5</u> G6
B30	73	71	72	72 74	G30	-	_		3 7		2	72 74	R7
G31	75	73	74	76	R31				5 7		4	76	B7
R32	77	75 77	76 78	78	B31			B8 7			6 8	78	G8
B32	79	79	80	80	G32	_	_		9 7		0	80	GND
GND RFU4	81 83	81	82	82 84	GND RFU3			G9 8 R10 8	3 8		2	82 84	R9 B9
RFU6	85	83	84	86	RFU5	_		B10 8	5 8		4	86	G10
RFU8	87	85 87	86 88	88	RFU7	_		G11 8	7 8		6 8	88	R11
RFU10	89	89	90	90	RFU9	_		R12 8	9 0		0	90	B11
RFU12	91 93	91	92	92 94	RFU11 RFU13	_		B12 9	$\frac{1}{3}$ $\stackrel{\circ}{9}$		2	92 94	G12 GND
RFU14 GND	95	93	94	96	GND	_	_	GND 9 G13 9		3 9	4	96	R13
RFU16	97	95	96	98	RFU15	_		R14 9	7 9		6	98	B13
RFU18	99	97	98	100	RFU17	_		B14 9	9 9		8	100	G14
×	101		100 102	102 ×		_		G15 10	4	9 10 0110		102	R15
X	103 105		104	104 🔾				R16 10	3 4	0310		104 106	B15 G16
X	105	105		108 ×			_	B16 10 GND 10	0 4	0510		108	GND
GND ×	109		108	110 ×	GND			. 10	9 1	0710		110	OND
GND	111		110	112	GND	_		<del>\( \)</del> 11	1 1	0911		112 💸	
×	113		112 114	114 ×		<del>_</del>		<u>√ 11</u>	J 4	1111 1311		114	
	115		116	116 ^	-			CNID 2 11	J 4	1511		116 ^	CND
	117 119	117	118	118 120	<del> </del>			GND 11 GND 11	1	1711	8	118 ^ 120	GND GND
		119	120	,,,,,	•		_	0.10	1	1912	0	120	3110
EXT_5V				•	EXT_5V								
EX1_9V					EX 1_9V								

	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						
1	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	/					
1	R24	49	50	B23						
/	B24	51	52	G24	/					
	GND	53	54	GND						
1	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	1					
1	B28	65	66	G28	/					
,	GND	67	68	GND	,					
1	G29	69	70	R29	1					
1	R30	71	72	B29	1					
1	B30	73	74	G30	/					
1	G31	75	76	R31	1					
1	R32	77	78	B31	1					
/	B32	79	80	G32	1					
1	GND	81	82	GND	/					
1	RFU4	83	84	RFU3	1					
1	RFU6	85	86	RFU5	1					
/	RFU8	87	88	RFU7	/					
/	RFU10	89	90	RFU9	/					
1	RFU12	91	90	RFU11	/					
/	RFU14	93	94	RFU13	/					
,	GND	95	96	GND	1					
1	RFU16	97	98	RFU15	,					
1	RFU18	99	100	RFU17	/					
1	NC	101	102	NC	/					
	NC NC	103	102	NC NC						
	NC NC	105	104	NC NC						
	NC NC	103	108	NC NC						
	GND	107	110	GND						
	GND	111	112	GND						
-	NC	113	114	NC						
	VCC	115	116	VCC						
	VCC	117	118	VCC						
	VCC	117	120	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					
Cigobit Ethornot port	Port1_T0+	9	10	Port2_T0+	Cigabit Etharnat part				
Gigabit Ethernet port	Port1_T0-	11	12	Port2_T0-	Gigabit Ethernet port				

		JH2	)		
	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-	
	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
Display enable	OE_B	49	50	OE_G	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	/
1	R8	75	76	B7	/
1	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	l l
	GND NC	107	108	GND	
	NC NC	109	110	NC NC	
	NC NC	111	112	NC NC	
	NC NC	113 115	114	NC NC	
	GND	115	116 118	GND	
	GND	117	110	GIVID	

JH2								
	GND	119	120	GND				

## 64 Groups of Serial Data

			JH1								JH2		
GND	1	4	_	2	GND			Eth_Sheild	1	4	_	2	Eth_Sheild
	<sub>×</sub> 3	1 3	2	4		_		Eth_Sheild	3	1	2	4	Eth_Sheild
	× 5	5	6	6 û					× 5	5	6	6 ×	
	$\hat{\chi} \frac{7}{2}$	7	8	8 2				Dortt TO	$\hat{\chi}$ 7	7	8	8 🗘	Dorto TO
	<del>2 9</del>	9	10	10 🔆				Port1_T0+ Port1_T0-	^ 9 11	9	10	10 ^ 12	Port2_T0+ Port2_T0-
	× 13	11	12	14			_	r orti_ro-	. 13	11	12	14	1012_10-
	<del>2 15</del>	13	14	16				Port1_T1+	× 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 🗘				D 44 TO	× 19	19	20	20 ×	D 10 TO
GND	21	21	22	22 ^ 24 ×			_	Port1_T2+ Port1_T2-	^ 21 23	21	22	22 ^ 24	Port2_T2+ Port2_T2-
GND	× 25	23	24	26 ×	GND		_	POILI_12-	25	23	24	26	P0112_12-
Data50	27	25	26	28	Data49	_		Port1 T3+	× 27	25	26	28 ×	Port2_T3+
Data52	29	27	28	30	Data51	_		Port1_T3-	29	27	28	30	Port2_T3-
Data54	31	29 31	30 32	32	Data53				× 31	29 31	30 32	32 ×	
Data56	33	33	34	34	Data55	_		STA_LEDB-	^ 33	33	34	34	STA_LEDR-
Data58 Data60	35 37	35	36	36 38	Data57 Data59	_		Input_KEY_I	N 35 37	35	36	36 38	STA_LEDG- GND
GND	39	37	38	40	GND	_		A	39	37	38	40	DCLK1
Data62	41	39	40	42	Data61	_		В	41	39	40	42	DCLK2
Data64	43	41	42	44	Data63	_		С	43	41	42	44	LAT
NC	45	43 45	44 46	46	NC			D	45	43 45	44 46	46	CTRL
NC NC	47	47	48	48	NC	_		E	47	47	48	48	OE_R
NC NC	49 51	49	50	50 52	NC NC	_		OE_B GND	49 51	49	50	50 52	OE_G GND
GND	53	51	52	54	GND	_	_	Data2	53	51	52	54	Data1
NC	55	53	54	56	NC	_	_	Data4	55	53	54	56	Data3
NC	57	55	56	58	NC			Data6	57	55	56	58	Data5
NC	59	57 59	58 60	60	NC	_		Data8	59	57 59	58 60	60	Data7
NC NC	61	61	62	62	NC	_	_	Data10	61	61	62	62	Data9
NC NC	63 65	63	64	64 66	NC NC	_		Data12 GND	63 65	63	64	64 66	Data11 GND
GND	67	65	66	68	GND	_	$\leftarrow$	Data14	67	65	66	68	Data13
NC	69	67	68	70	NC	_		Data16	69	67	68	70	Data15
NC	71	69 71	70 72	72	NC			Data18	71	69 71	70 72	72	Data17
NC	73	73	74	74	NC			Data20	73	73	74	74	Data19
NC NC	75	75	76	76	NC	_		Data22	75 77	75	76	76	Data21
NC NC	77 79	77	78	78 80	NC NC	7		Data24 GND	77 79	77	78	78 80	Data23 GND
GND	81	79	80	82	GND	_		Data26	81	79	80	82	Data25
RFU4	83	81	82	84	RFU3			Data28	83	81	82	84	Data27
RFU6	85	83 85	84 86	86	RFU5	_		Data30	85	83 85	84 86	86	Data29
RFU8	87	87	88	88	RFU7	_		Data32	87	87	88	88	Data31
RFU10	89 91	89	90	90 92	RFU9	_		Data34	89 91	89	90	90	Data33
RFU12 RFU14	93	91	92	94	RFU11 RFU13	<del>_</del>	_	Data36 GND	93	91	92	92 94	Data35 GND
GND	95	93	94	96	GND	_	_	Data38	95	93	94	96	Data37
RFU16	97	95	96	98	RFU15	_		Data40	97	95	96	98	Data39
RFU18	99	97	98 100	100	RFU17	_		Data42	99	97 99	98 100	100	Data41
	× 101		1102	102		<del></del>		Data44	101		100	102	Data43
	2 103		3104	104 🗘				Data46	103		104	104	Data45
	105		5106	106 🔆				Data48 GND	105 107		106	106 108	Data47 GND
GND	× 107		7108	110 ×	GND		_	CHD	. 109	107	108	110	CIAD
GND	111		9110	112	GND				× 111		110	112	
	× 113		1112 3114	114 ×					<del>2</del> 113		112 114	114 💸	
	<u> 115</u>		51 14	116	_			oup.	× 115		116	116	ONE
	117 119		7118	118 120				GND GND	^ 117 119		118	118 ^ 120	GND GND
	119		120	120	<del></del>		_	GIND	118		120	120	GIND
EVE 514												I	
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							

		J⊦	l1		
/	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	1
/	Data64			Data63	/
/	NC	43 45	44	NC	
	NC NC		46	NC NC	
		47	48		
	NC NO	49	50	NC NO	
	NC	51	52	NC	
	GND	53	54	GND	, 1
	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	/
1	RFU6	85	86	RFU5	/
1	RFU8	87	88	RFU7	/
1	RFU10	89	90	RFU9	/
1	RFU12	91	92	RFU11	/
1	RFU14	93	94	RFU13	/
	GND	95	96	GND	
1	RFU16	97	98	RFU15	/
1	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

			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+	/( ) ·
	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	E	47	48	OE_R	Display enable
Display enable	OE_B	49	50	OE_G	Display enable
	GND	51	52	GND	
1	Data2	53	54	Data1	/
1	Data4	55	56	Data3	/
1	Data6	57	58	Data5	/
	Data8	59	60	Data7	/
1	Data10	61	62	Data9	/
/	Data12	63	64	Data11	/
	GND	65	66	GND	
1	Data14	67	68	Data13	/
	Data16	69	70	Data15	/
1	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	/

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 VCC 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	l	/		
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 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 × 8.0 mm	
	Net weight	22.8 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  Note: If the product does not have the relevant certifications required by the countries or regions where it is to be sold, please apply for the certifications yourself or contact NovaStar to apply for them.		

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

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