



CHARMING Co., Ltd.

FPGA Receiving Card

L4SPRO Product
Specifications

Content

1 Product Overview.....	1
Product Introduction	1
Product Features	1
2Function Introduction.....	2
3Product Parameters.....	6
Basic Parameters.....	6
Hardware Introduction.....	6
Output Port Definition.....	7
Indicator Illustration	17
Dimensions	17
4Product Specifications.....	19
Specifications.....	19
Precautions.....	19

Updates History

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<i>V3.0</i>	<i>31/03/2020</i>	<i>First Edition</i>
<i>V3.1</i>	<i>16/04/2021</i>	<i>Hardware Updated/ Electronic Components Replaced/Product Appearance changed</i>

1 Product Overview

Product Introduction

*L4SPRO is a small sized receiving card that fully researched and developed by Mooncell; it adopted the high-precision 120 PIN connector; it can supports the maximum 32 groups of the parallel connection data; the maximum loading capacity could reach up to 256*512 pixels; with strong processing ability, supper reliability and high competitive price.*

Product Features

- ☐ *It features the small size and thickness, saving a lot more space for the narrow cabinet and space of the led strip(bar).*
- ☐ *It features high precision connector, which is dust-proof & shock proof; with high reliability and stability.*
- ☐ *It supports dual card backup function, which has enhanced the reliability and stability.*
- ☐ *With strong LED Driver IC compatibility.*

Application Scenarios

It could be widely used for high-end LED display area that requires high standards; and has significant advantages in application scenarios such as led rental display, TV Broadcast, LED display for respectable Event, High-end project, etc.

2 Function Introduction

Displaying Effect

<i>It supports pixel level brightness and Chroma Calibration</i>	<i>Using it with the Mooncell Calibration Software to calibrate each one of the pixels on its brightness and Chroma. It can effectively eliminate the Chromatic aberration so as to enhance its consistency of the brightness and Chroma to a high level and result in a better displayed effects.</i>
<i>Multiple Solutions of the Displayed Effects are Supported</i>	<i>Using it with Monncell AutoLED Software, the Refresh and Grey Scale performances are able to take the precedence over other settings.</i>
<i>The Images on the led screen can be rotated 90 degree in a factor of multiple times</i>	<i>Using it with Mooncell AutoLED Software.</i>
<i>The images can be zoomed in or out</i>	<i>Using it with Mooncell AutoLED</i>

Enhanced Operability:

<i>The Receiving Card is Supported to detect its own Sequence number</i>	<i>Using the Network Port testing function on Mooncell AutoLED Software, the receiving card serial number and the Network Port Information will be displayed on the target cabinet. Users will be able to get to know the locations of the receiving cards as well as its Connection diagram.</i>
<i>Data Port User-Defined is supported</i>	<i>Using it with the Mooncell AutoLED Software, you can detect and edit the output data of the receiving cards.</i>
<i>To build up a complicated cabinet is supported</i>	<i>On AutoLED Software, there is an 'Advanced Setting', from here you can quickly arrange or structure the</i>

	<i>modules at your option.</i>
<i>To structure a complicated Led Screen is supported</i>	<i>On AutoLED Software, there is a “Complicated Led Screen Connection”, from here you can quickly arrange or structure the cabinet modules on your option.</i>
<i>Intelligent Module is supported(Customized)</i>	<i>The Intelligent Module consists of Flash and MCU. The Flash can reserve the calibration data and information of the PCB Board. The MCU can be communicated with the receiving cards so as to detect the temperature, voltage and wiring connectivity of each module (on a module-level: module by module). With Intelligent Module, the monitor cards are not necessary for the Monitor Users, which means you can save a lot more space on the cabinets.</i>
<i>Module Self-Calibrated is supported(Customized)</i>	<i>When a module is replaced, the receiving card will automatically read the ID and its calibration data of the new one once the electricity power is connected, and the data will be reserved to the Flash.</i>

Hardware Stability

<i>Ethernet Cable Backup(Hot Backup)</i>	<i>The main cable will be having the loop connection. If there's one cable breaks then still there will have another one to make sure the led display work properly.</i>
	<i>Dual receiving cards backup is supported(Dual Circuit backup design) Customized :when the main</i>

	<p>working receiving card fails, the other one (backup) will take its job to keep the led display working properly.</p>
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Smart Software and Hardware Stability

<p>The receiving card can read the configuration data back from where it has been stored</p>	<p>You will be able to do this on Mooncell AutoLED Software.</p>
<p>It supports to detect the error rates of the network cable</p>	<p>On the Mooncell AutoLED Software, you can detect the network cable connectivity in real time to tell the condition of the network cables, so that you can get rid of any errors immediately.</p>
<p>Communication Monitoring Function</p>	<p>On Mooncell AutoLED Software, you can monitor the Working Status of the receiving cards in real time.</p>
<p>Dual Power Supplies Backup is supported</p>	<p>2 Power Supplies can be connected simultaneously and the working status can be detected. Whenever there's a power supply failure, it can be detected, the system then will automatically decrease the brightness of the led screen so that it can still keep working properly</p>
<p>LCD Module is supported(Customized)</p>	<p>The LCD Module can be connected to the HUB board to display the temperature, voltage, single running time and total running time of the receiving cards.</p>
<p>It supports to detect the voltage</p>	<p>It will detects the voltage status of the receiving cards.</p>
<p>It supports to detect the temperature</p>	<p>The operating temperature of the receiving cards could be detected.</p>
<p>It supports to detect the power status</p>	<p>The power status of the power supplies could be detected.</p>

It supports the reset function

Once the online upgrading finished, it could automatically reset the hardware.

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3 Product Parameters

Basic Parameters

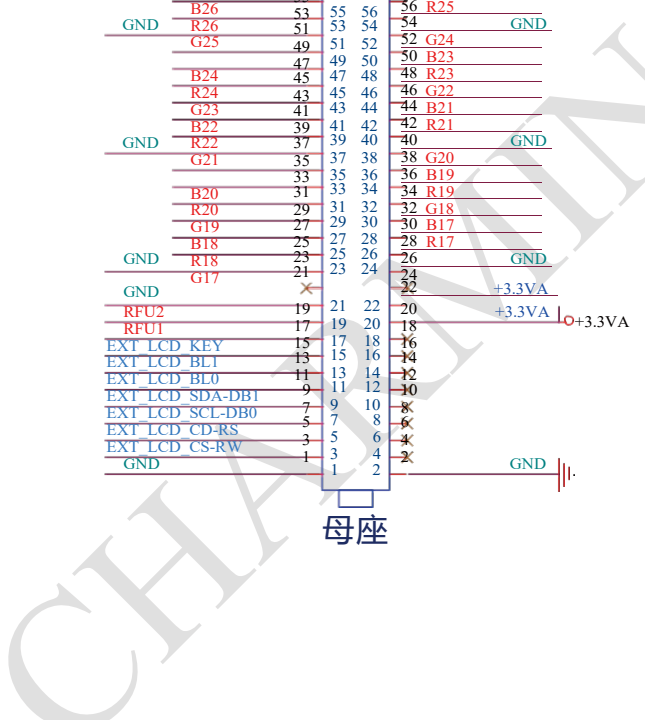
RGB Parallel	The Maximum Loading Capacity(Pixels)	Loading Capacity After lightness Calibrating (Pixels)	Loading Capacity after Color Calibrating(Pixels)
32 Groups	256*512	256*512	256*352

Single Network Pot Cascading Quantity	Scanning Lines Supported		
≤1000PCS	1-64 Scan		

Hardware Introduction



Port Definition of the 32 Groups of parallel connection data



<i>Illustration</i>	<i>Definition</i>	PIN	PIN	Definition	<i>Illustration</i>
	GND	1	2	GND	

LCD Data Signal	EXT_LC D_SDA	9	10	NC	
LCD Backlight Signal 1	EXT_LC D_BL0	11	12	NC	
LCD Backlight Signal 2	EXT_LC D_BL1	13	14	NC	
LCD Control KEY	EXT_LC D_KEY	15	16	NC	
Extension Port	RFU1	17	18	NC	
	RFU2	19	20	3.3V_LED	3.3V Subsidiary Output
	GND	21	22		
	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	
	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	
	NC	121	122	NC	

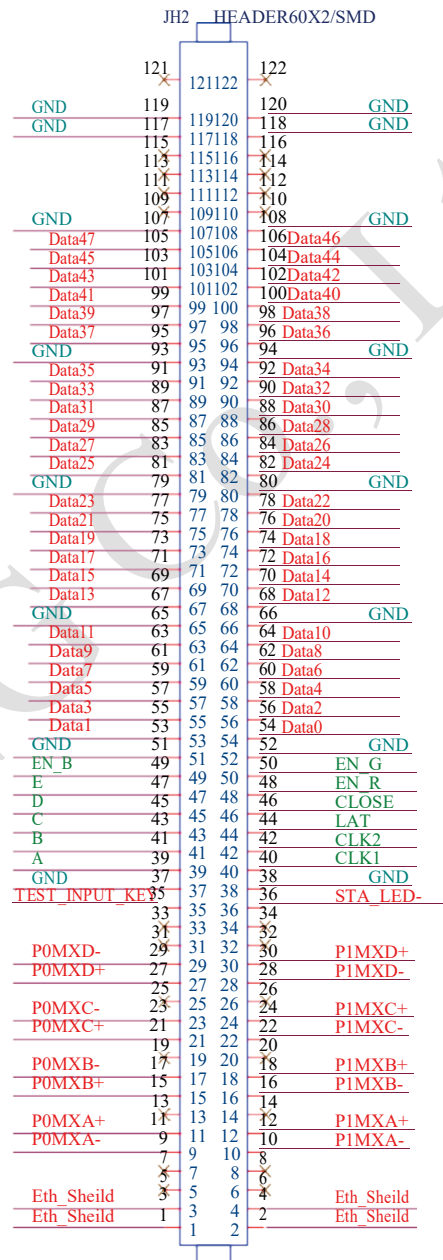
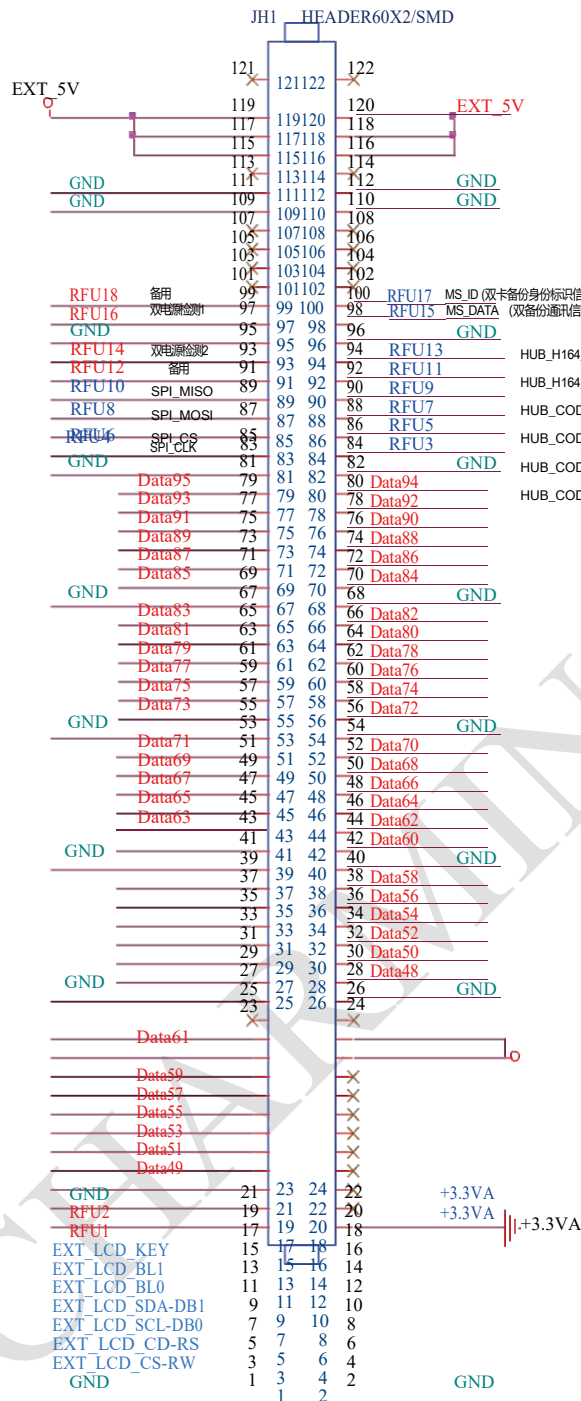
JH2 Definition:

Illustration	Definition	PIN	PIN	Definition	Illustration
	NC	1	2	NC	
	NC	3	4	NC	
	NC	5	6	NC	
	NC	7	8	NC	
Gigabyte Ethernet Port	P0 MXA+	9	10	P1 MXA+	Gigabyte Ethernet Port
	P0 MXA-	11	12	P1 MXA-	
	NC	13	14	NC	
	P0 MXB+	15	16	P1 MXB+	
	P0 MXB-	17	18	Port2_B-	
	NC	19	20	NC	
	P0 MXC+	21	22	P1 MXC+	
	P0 MXC-	23	24	P1 MXC-	
	NC	25	26	NC	
	P0 MXD+	27	28	P1 MXD+	
	P0 MXD-	29	30	P1 MXD-	

	NC	31	32	NC	
	NC	33	34	NC	
Testing Key	TEST_INPUT_KEY	35	36	STA_LED-	Operating Indicator(ACTIVE LOW)
	GND	37	38	GND	
Line Decoding Signal	OUTA	39	40	OUTCLK_1	First Shift Clock Output
Line Decoding Signal	OUTB	41	42	OUTCLK_2	Second Shift Clock output
Line Decoding Signal	OUTC	43	44	OUTLAT	Latch Signal output
Line Decoding Signal	OUTD	45	46	OUTCLOSE	Blanking Control Signal
Line Decoding Signal	OUTE	47	48	OUTEN_R	Display enable (when OE_R, G, B are not controlled separately, use OE_R)
Display enable (when OE_R, G, B are not controlled separately, use OE_R)	OUTEN_B	49	50	OUTEN_G	
	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	
	NC	121	122	NC	

96 Groups of Serial Connection Data Port



JH1 Definition :

Illustration	Definition	PI N	PI N	Definition	Illustration
	GND	1	2	GND	
CS Signal of the LCD	EXT_LCD_CS	3	4	NC	
RS Signal of the LCD	EXT_LCD_RS	5	6	NC	
LCD Clock Signal	EXT_LCD_SCL	7	8	NC	
LCD Data Signal	EXT_LCD_SD A	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 KEY	EXT_KEY	15	16	NC	
Extension Port	RFU1	17	18	NC	3.3V Subsidiary Output
	RFU2	19	20	3.3V_LE D	
	GND	21	22		
	NC	23	24	NC	
	GND	25	26	GND	
	Data49	27	28	Data48	
	Data51	29	30	Data50	
	Data53	31	32	Data52	
	Data55	33	34	Data54	
	Data57	35	36	Data56	
	Data59	37	38	Data58	
	GND	39	40	GND	
	Data61	41	42	Data60	
	Data63	43	44	Data62	
	Data65	45	46	Data64	
	Data67	47	48	Data66	
	Data69	49	50	Data68	
	Data71	51	52	Data70	
	GND	53	54	GND	
	Data73	55	56	Data72	
	Data75	57	58	Data74	
	Data78	59	60	Data76	
	Data77	61	62	Data78	
	Data79	63	64	Data80	
	Data81	65	66	Data82	
	GND	67	68	GND	
	Data85	69	70	Data84	
	Data87	71	72	Data86	

	Data89	73	74	Data88	
	Data91	75	76	Data90	
	Data93	77	78	Data92	
	Data95	79	80	Data94	
	GND	81	82	GND	
<i>Extension Port</i>	RFU4	83	84	RFU3	<i>Extension Port</i>
	RFU6	85	86	RFU5	
	RFU8	87	88	RFU7	
	RFU10	89	90	RFU9	
	RFU12	91	92	RFU11	
	RFU14	93	94	RFU13	
	GND	95	96	GND	
<i>Extension Port</i>	RFU16	97	98	RFU15	<i>Extension Port</i>
	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	
<i>Input Power VCC 3.3V-5.5V(recommended)</i>	VCC	115	116	VCC	<i>Input Power VCC 3.3V-5.5V(recommended)</i>
	VCC	117	118	VCC	
	VCC	119	120	VCC	

JH2 Definition :

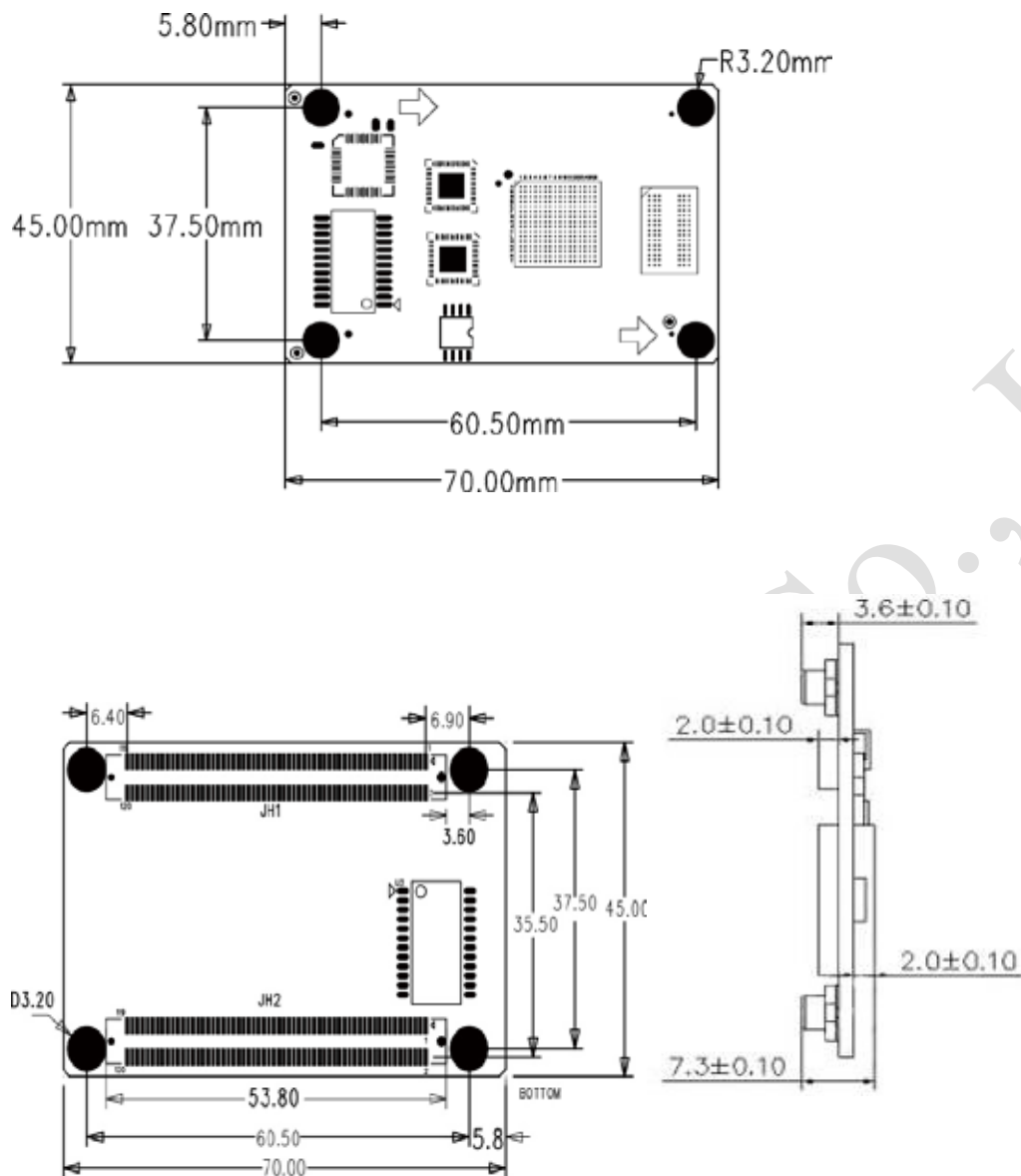
Illustration	Definition	PIN	PIN	Definition	Illustration
External Shield Ground	Eth_Sheid	1	2	Eth_Sheild	External Shield Ground
External Shield Ground	Eth_Sheid	3	4	Eth_Sheild	External Shield Ground
	NC	5	6	NC	
	NC	7	8	NC	
Gigabyte Ethernet Port	P0 MXA-	9	10	P1 MXA-	Gigabyte Ethernet Port
	P0 MXA+	11	12	P1 MXA+	
	NC	13	14	NC	
	P0 MXB+	15	16	P1 MXB+	
	P0 MXB-	17	18	Port2_B-	
	NC	19	20	NC	
	P0 MXC+	21	22	P1 MXC-	
	P0 MXC-	23	24	P1 MXC+	
	NC	25	26	NC	
	P0 MXD+	27	28	P1 MXD+	
	P0 MXD-	29	30	P1 MXD-	
	NC	31	32	NC	
	NC	33	34	NC	
Testing Key	TEST_INPUT_KEY	35	36	STA_LED-	Operating Indicator(ACTIVE LOW)
	GND	37	38	GND	
Line Decoding Signal	A	39	40	CLK_1	First Shift Clock Output
Line Decoding Signal	B	41	42	CLK_2	Second Shift Clock output
Line Decoding Signal	C	43	44	LAT	Latch Signal output
Line Decoding Signal	D	45	46	CTRL	Blanking Control Signal
Line Decoding Signal	E	47	48	OE_R	Display enable (when OE_R, G, B are not controlled separately, use OE_R)
Display enable (when OE_R, G, B are not controlled separately, use	OE_B	49	50	OE_G	

OE_R)					
	GND	51	52	GND	
	Data1	53	54	Data0	
	Data3	55	56	Data2	
	Data5	57	58	Data4	
	Data7	59	60	Data6	
	Data9	61	62	Data8	
	Data11	63	64	Data10	
	GND	65	66	GND	
	Data13	67	68	Data12	
	Data15	69	70	Data14	
	Data17	71	72	Data16	
	Data19	73	74	Data18	
	Data21	75	76	Data20	
	Data23	77	78	Data22	
	GND	79	80	GND	
	Data25	81	82	Data24	
	Data27	83	84	Data26	
	Data29	85	86	Data28	
	Data31	87	88	Data30	
	Data33	89	90	Data32	
	Data35	91	92	Data34	
	GND	93	94	GND	
	Data37	95	96	Data36	
	Data39	97	98	Data38	
	Data41	99	100	Data40	
	Data43	101	102	Data42	
	Data45	103	104	Data44	
	Data47	105	106	Data46	
	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	
	NC	121	122	NC	

Indicator Illustration

<i>Indicator</i>	<i>Position</i>	<i>Status</i>	<i>Illustration</i>
<i>Status Indicator (Green)</i>	<i>U6</i>	<i>Flickering Slowly at a constant</i>	<i>The receiving card is working properly, The Ethernet Cable Connection is fine, No DVI Signal Input</i>
		<i>Flickering Fast at a constant</i>	<i>The receiving card is working properly, The Ethernet Cable Connection is fine, with DVI Signal Input</i>
		<i>It goes out</i>	<i>No Gigabit Ethernet Signal</i>
		<i>Fast Flickering 3 Times</i>	<i>The receiving card is working properly, The Ethernet Cable Loop Connection is fine, DVI Signal Input</i>
<i>Status Indicator</i>	<i>U5</i>	<i>Long Lasting On</i>	<i>Power is On</i>

Dimensions



4Product Specifications

Specifications

<i>Electric Parameters</i>	<i>Input Voltage</i>	<i>DC3.5-5.5V</i>
	<i>Rated Current</i>	<i>0.6A</i>
	<i>Rated Power</i>	<i>3W</i>
<i>Operating Environment</i>	<i>Operating Temperature</i>	<i>-20 °C - 70 °C</i>
	<i>Operating Humidity</i>	<i>10%RH-90%RH</i>
<i>Storage Environment</i>	<i>Temperature</i>	<i>-25 °C ~125 °C</i>
<i>Dimensions</i>	<i>70mmX45mm</i>	
<i>Net Weight</i>	<i>18.3g</i>	
<i>Certifications</i>	<i>It conforms to RoHS and CE-EMC standards.</i>	

Precautions

- 1. The testing (debugging) and installation should be done by the qualified professionals*
- 2. Anti-Static, Water-Proof and Dust-Proof Required*