



# RV665S

## RECEIVING CARD

The RV665S is a high-end small receiving card developed by TWT. A single RV665S loads up 320×256 pixels (8bit), or 256×256 pixels (10bit/12bit). Supporting the pixel level brightness and chroma calibration, individual Gamma adjustment for RGB, and 3D functions, the RV665S can greatly improve the display effect and user experience.

The RV665S 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 RV665S has improved electromagnetic compatibility and is suitable to various on-site setups.



With support for high-speed data transmission and multi-channel parallel output, the **HUB66S** control board ensures **stable image rendering, high refresh rates, and accurate color reproduction**. The board is suitable for both indoor and outdoor LED display applications, including advertising screens, information boards, stage displays, and customized LED wall systems.

The modular hardware architecture allows flexible system expansion, simplified installation, and reliable long-term operation, making the **HUB66S** an ideal choice for scalable LED display solutions.

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Supports **HUB66S** standard interface for RGB LED matrix modules

Multiple **HUB66S** output connectors for parallel control of multiple LED panels

Gigabit Ethernet interface for high-speed data input and network communication

Integrated self-test function for standalone panel verification RS-485 interface for external control, configuration, or cascading communication

FPC (ZIF type) connector for high-density inter-board signal transmission

Stable 5V power input via dedicated power sockets

Optimized PCB layout for high signal integrity and reduced electromagnetic interference

Designed for continuous 24/7 operation in professional LED display environments

## Improvements to Display Effect

- Pixel level brightness and chroma calibration Working with TWT, 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.

- 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 TWT (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°).

### Improvements to Maintainability

- Smart module (supported by dedicated firmware)

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.

### Improvements to Maintainability

- 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 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.

- Firmware program readback

The firmware program of the receiving card can be read back and saved to the local computer.

- Configuration parameter readback

The configuration parameters of the receiving card can be read back and saved to the local computer.

- LVDS transmission (supported by dedicated firmware)

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 TWTV5.2.0 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 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

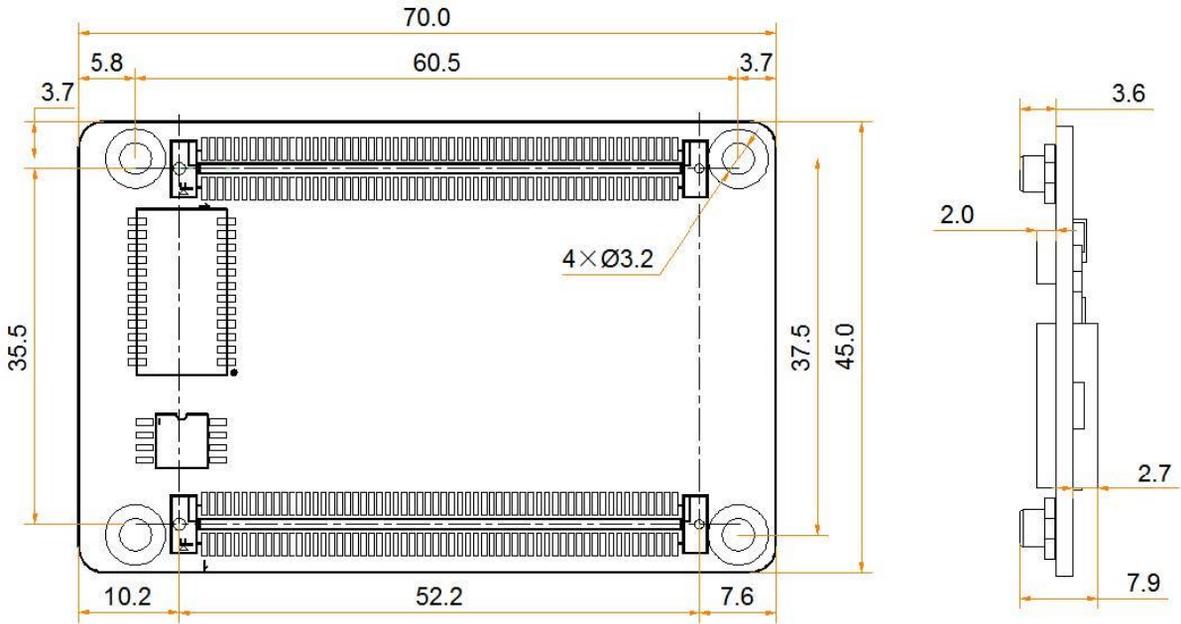
The calibration coefficients are stored in the application area and factory area of the receiving card at the same time. Users usually use the calibration coefficients in the application area. If necessary, users can restore the calibration coefficients in the factory area to the application area.

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.

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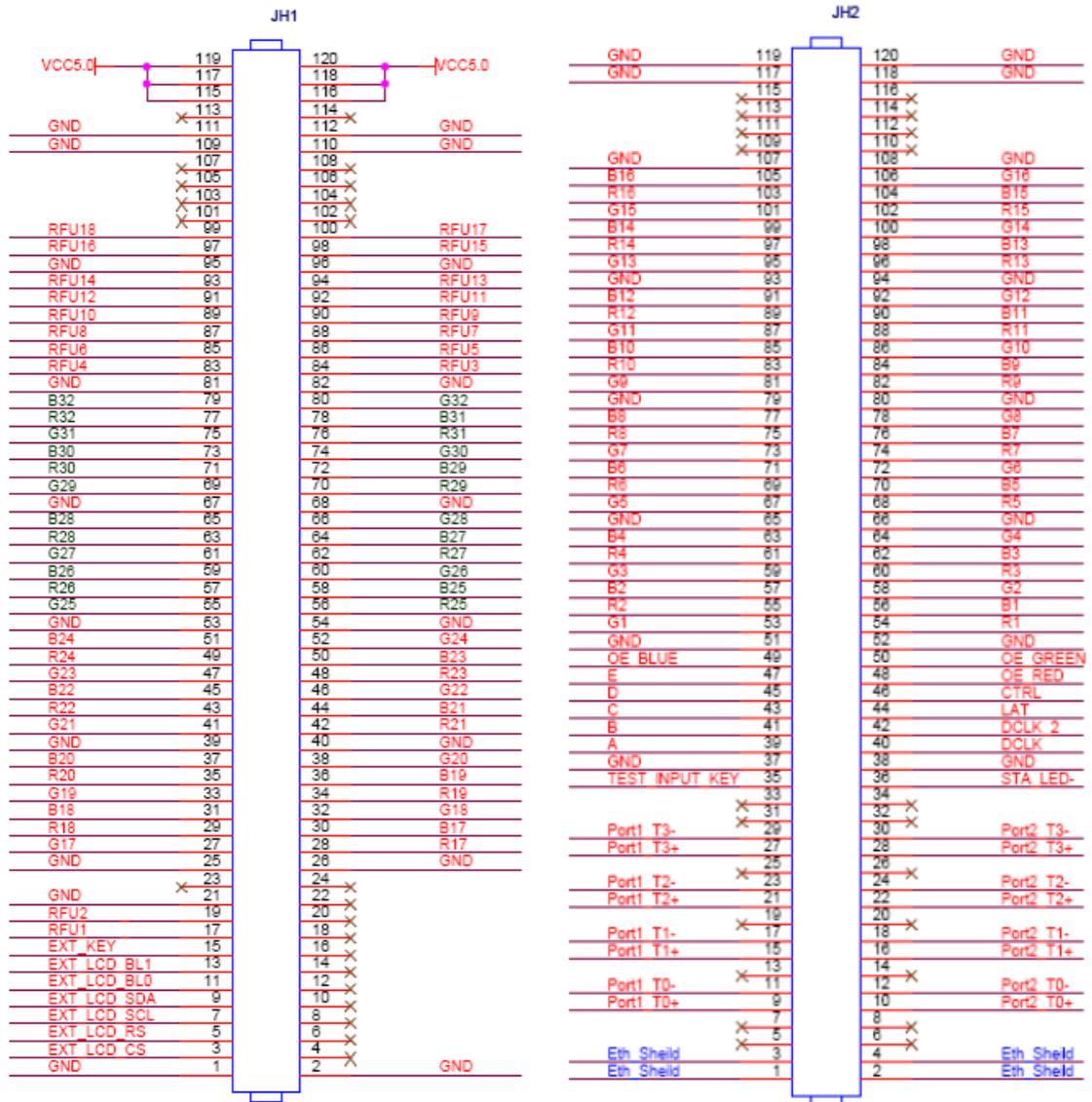
## DIMENSIONS

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 8.0 mm. Ground connection (GND) is enabled for mounting holes



Tolerance:  $\pm 0.1$  Unit: mm

## Pins for 32 Groups of Parallel Data

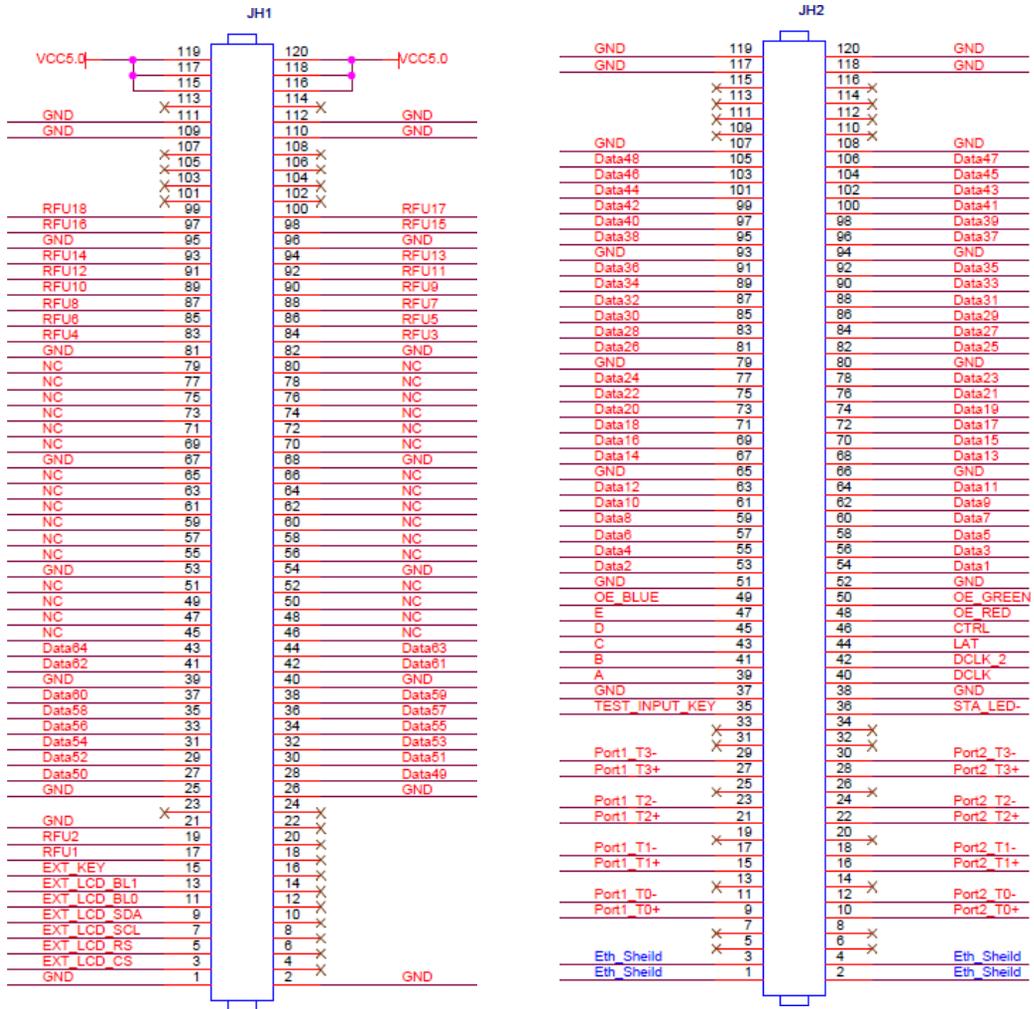


JH1					
	GND	1	2	GND	
LCD CS signal	EXT_LCD_CS	3	4	NC	
LCD RS signal	EXT_LCD_RS	5	6	NC	
LCD clock signal	EXT_LCD_SCL	7	8	NC	
LCD data signal	EXT_LCD_SDA	9	10	NC	
LCD backlight signal 1	EXT_LCD_BL0	11	12	NC	
LCD backlight signal 2	EXT_LCD_BL1	13	14	NC	
LCD control button	EXT_KEY	15	16	NC	
/	RFU1	17	18	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	
/	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					
Chassisground	Eth_Sheild	1	2	Eth_Sheild	Chassisground
Chassisground	Eth_Sheild	3	4	Eth_Sheild	Chassisground
	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-	
	NC	31	32	NC	
	NC	33	34	NC	
Test button	TEST_INPUT_KEY	35	36	STA_LED-	Running indicator (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	Displayenable
Displayenable	OE_BLUE	49	50	OE_GREEN	Displayenable

JH2					
	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 signal1	EXT_LCD_BLO	11	12	NC	
LCD backlight signal2	EXT_LCD_BLI	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	/
	NC	45	46	NC	
	NC	47	48	NC	
	NC	49	50	NC	
	NC	51	52	NC	
	GND	53	54	GND	

JH1					
	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					
Chassisground	Eth_Sheild	1	2	Eth_Sheild	Chassisground
Chassisground	Eth_Sheild	3	4	Eth_Sheild	Chassisground
	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-		
	NC	31	32	NC	
	NC	33	34	NC	
Test button	TEST_INPUT_KEY	35	36	STA_LED-	Running indicator (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	/

JH2					
/	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	

Maximum Resolution	512 x 384 @60Hz		320×256 pixels (8bit) 256×256 pixels (10bit/12bit)
Electrical Specifications	Input voltage	DC 3.8V to 5.5V	DC 3.3 V to 5.5 V
	Rated current	0.5V	0.5 A
	Rated power consumption	2.5W	2.5 W
Operating Environment	Temperature	-20°C to + 70°C	-20°C to +70°C
	Humidity	10% RH to 90°C RH, non-condensing	10% RH to 90% RH, non-condensing
Storage Environment	Temperature	-25°C to + 125°C	-25°C to +125°C
	Humidity	0% RH to 95°C RH, non-condensing	0% RH to 95% RH, non-condensing
Physical Specification	Dimensions	145.7 mm x 91.5 mm x 18.4 mm	70.0 mm × 45.0 mm × 7.9 mm
	Net weight	93.1g	17.3 g
	Note	It is the weight of a single receiving card only.	
Packing Information	Packing specifications	Each receiving card is packaged in a blister pack. Each packing box contains 100 receiving cards.	An antistatic bag and anti-collision foam are provided for each receiving card. Each packing box contains 40 receiving cards.
	Packing box dimensions	625.0 mm x 180.0 mm x 470.0mm	378.0 mm × 190.0 mm × 120.0 mm

