

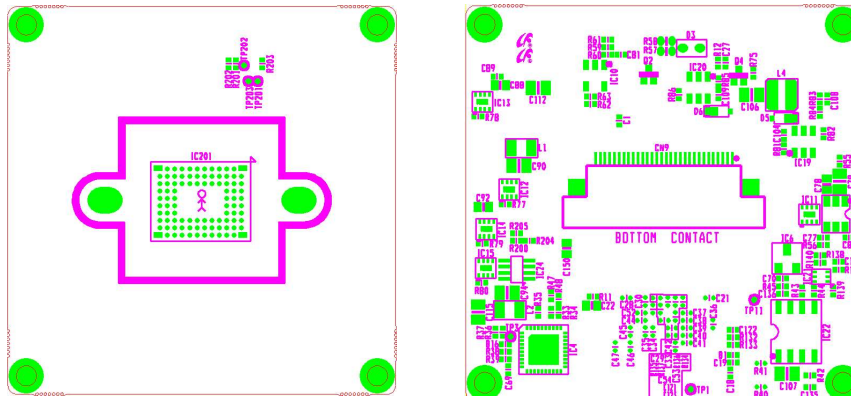


CUSTOMER	
ATTENTION 1	8.51M <b>Exmor-R™</b> CMOS
ATTENTION 2	42x42mm
MODEL	HCM-H972TN
CODE NO	

EX-SDI2/TVI/AHD/VBS Color Camera Module

# SPECIFICATIONS

12. 5. 2017



P&A Corporation



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## - Revision History

Date	Version	Description
JUL.27 2017	0A	Establishment
DEC.05 2017	0B	update osd
JAN.12 2018	1A	One BD --> Two BD



## 1. Features

### ■ 8.51M Exmor-R™ SONY CMOS

High definition 12-bit digital image signals offering 8.51 mega pixels are obtained with high speed of 60 fps (MIPI & SLVDS output I/F) and with low power consumption. High sensitivity, low dark current and no smear are achieved through the adoption of R, G and B primary color mosaic filters. This chip features an electronics shutter with variable charge- integration time.

### ■ High Resolution 4K(UHD)

This camera has realized high resolution of 3840(H) x 2160(V) using the top-notch full digital image processing, 12 Bit A/D serial signal processing and special algorithm technologies.

### ■ DNR (Digital Noise Reduction, 2D+3D)

The DNR technology eliminates noise thus generating a distinct and clear image.

This camera DNR function utilizes both an adaptive 2D filter reducing noise in the brightness of the image and an adaptive 3D filter reducing caused by movement.

### ■ DAY&NIGHT (Output the Filter changing signal)

This camera has the Day&Night function which outputs the filter changing signal with detecting the illumination condition. Day&Night operation feature an 'auto' mode which switches between day and night mode automatically based upon the level of illumination on the scene.

EXTERN mode changes between day and night operation upon triggering from an external source(Optional).

And also, the COLOR mode operates in daytime conditions to provide optimum colors, and B/W mode operates in night-time conditions to enhance the definition of the image.

### ■ OSD (On Screen Display)

This camera supports the OSD function that the camera can be controlled by selecting text displayed on the monitor screen.

### ■ Privacy Mask Function (8 area)

Privacy masking allows for the 'blinking' of specific areas of a scene, where the viewing or recording of images is prohibited or undesired.

The technology of this camera allows for the user defined setting of a 16 point rectangle mask, which is overlaid onto the video signal output.



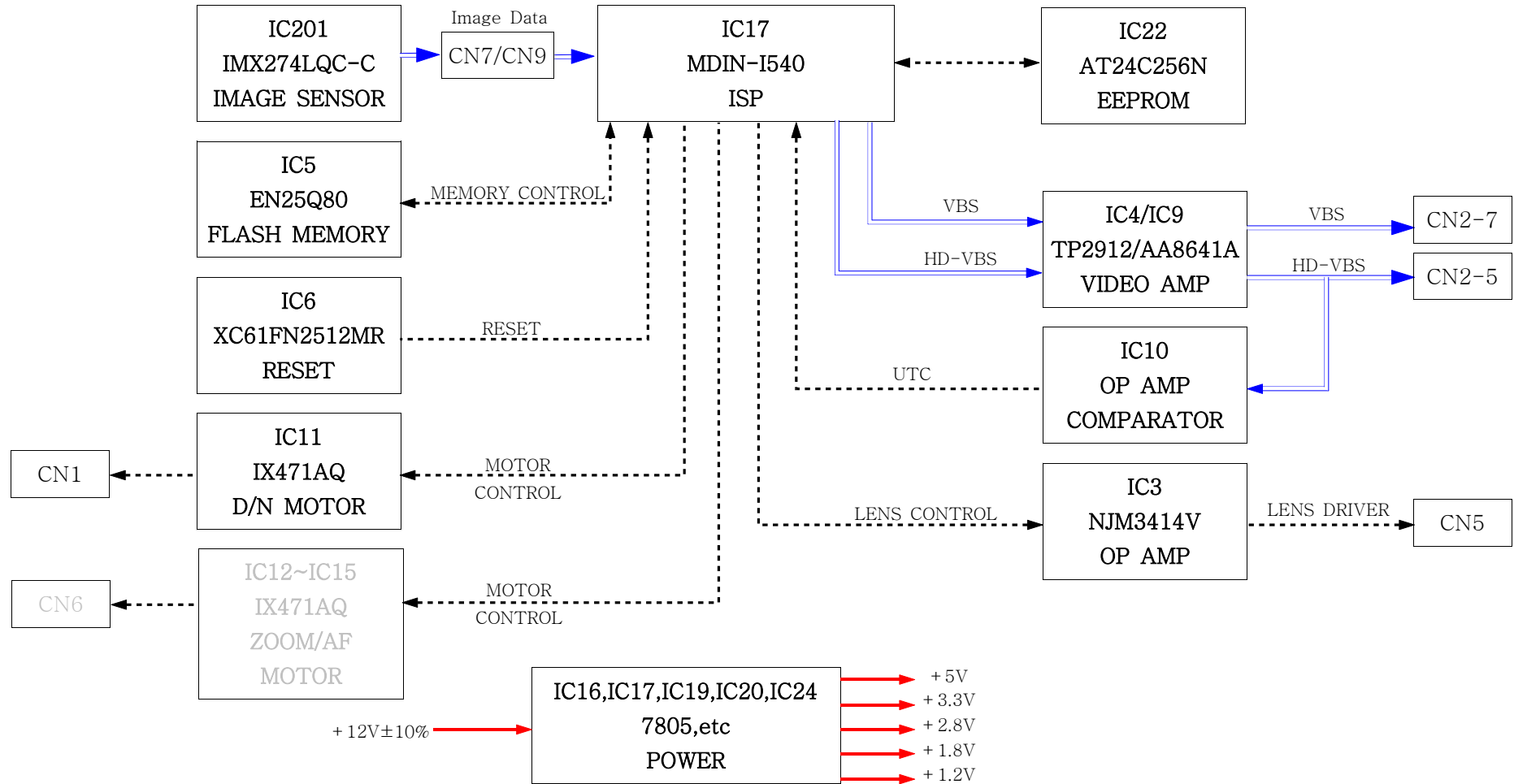
## 2. Applications & Information

### 2-1. General Specifications & Functions

Items	Sub-items	HCM-H972TN
CMOS	Device	1/2.5" 8.51M Exmor-R CMOS
	Total	3884 (H) × 2218 (V)
	Active	3864 (H) × 2196 (V)
Performance	Horizontal/Vertical Resolution	UHD,4K
	Minimum illumination (F1.2, AGC Max[27dB])	Color : 0.3 Lux(50IRE) / 0.15 Lux(15IRE) B/W : 0.15 Lux(50IRE) / 0.07 Lux(15IRE)
	G-Sensitivity	1,145digit(236mV)
	S/N Ratio	More than 50dB (AGC off)
	Frame	15fps 4K UHD
Functions	Day&Night	Auto/Color/B&W/EXTERN
	ATW	2,100 ~ 10,000K
	High Speed Shutter	1/30(1/25) ~ 1/10000
	D-WDR	Off/ON
	BLC	Off/ON
	HLC	Off/ON
	AGC	Max 27dB
	Camera ID	Off/On (Letters A~Z, Numerals 0~9, Symbols)
	White Balance	AUTO / PUSH /INDOOR/ OUTDOOR/ MANUAL
	DNR	2D+3DNR
	Motion Detection	Off/ON(4 areas)
	Privacy Mask	8 Areas (Rectangle & Polygon)
	etc Functions	DPC, LSC, Defog, DIS
	Sharpness, Contrast	0~20, 10~20
	Test Pattern	Off/ON
	In/Output	Alarm Output, Ext IR Mode, IR LED Off/On
UTC	Pelco-D	
Video Output	Analog Video Output(NTSC/PAL)	<b>Analog VBS 1.0Vp-p (75ohm Terminated)</b>
	HD Analog Video Output(Selectable)	<b>TVI VBS 1.0Vp-p (75ohm Terminated, 15fps)</b>
		AHD VBS 1.0Vp-p (75ohm Terminated)
Lens	Iris	DC iris(Galvanometer)
	TDN	Day & Night(Galvanometer)
	2MOTOR	2.7mm ~ 12mm
Operating Temperature		Absolute : -10°C ~ +50°C
Operating Humidity		Less than 90%
Dimension		42mm x 42 mm x 1.0t



## 2-2. Block Diagram

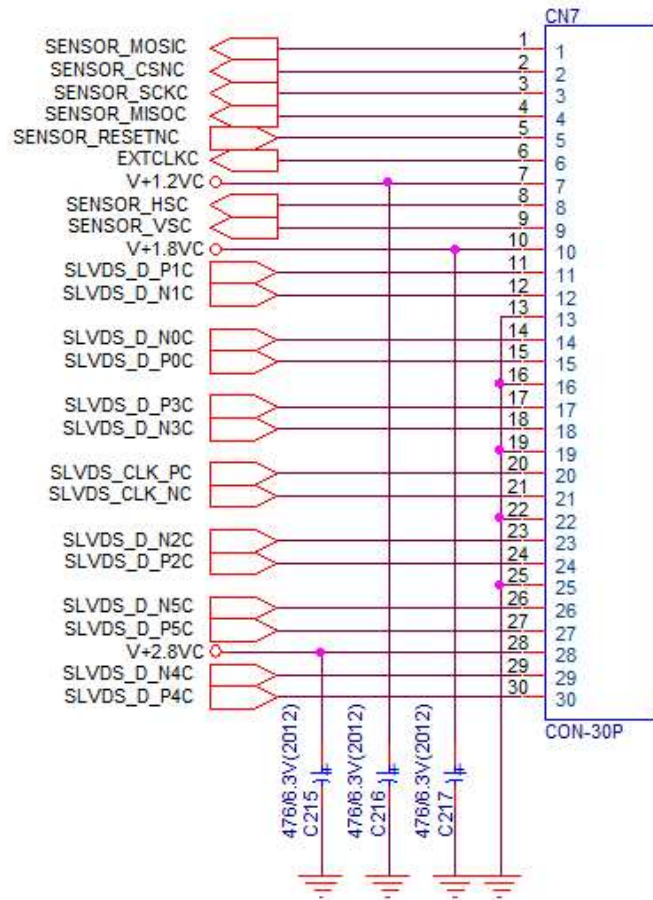




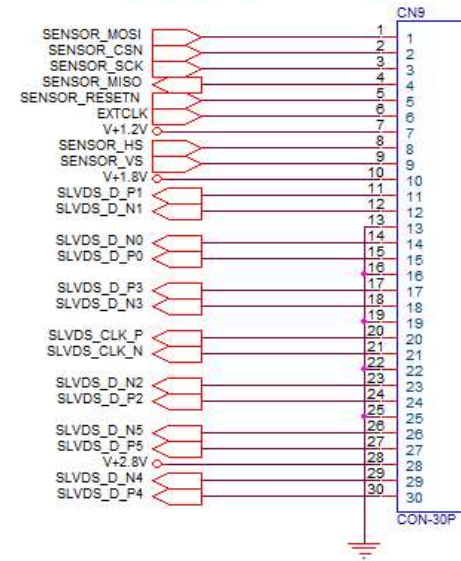
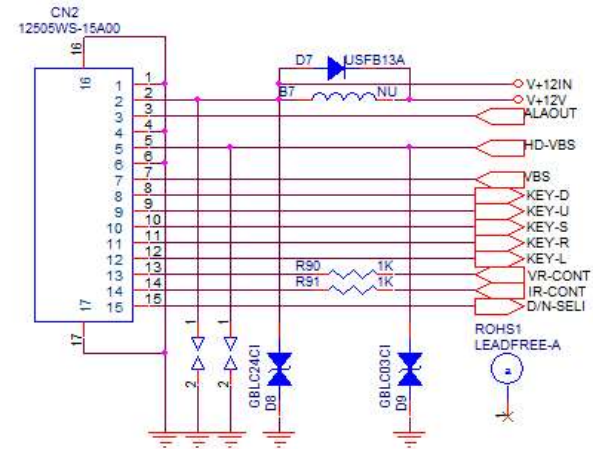
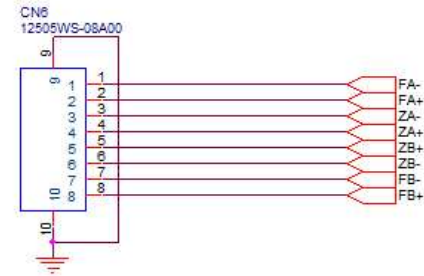
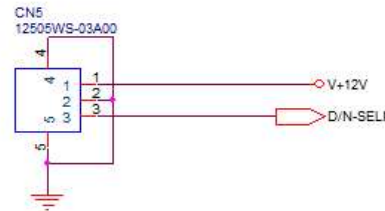
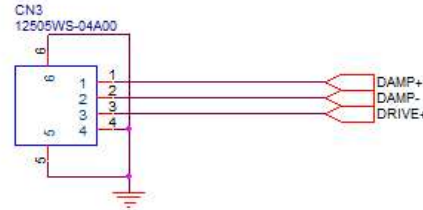
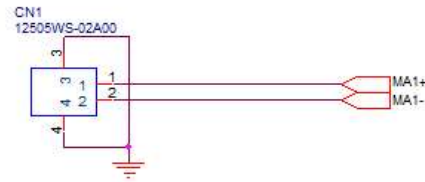
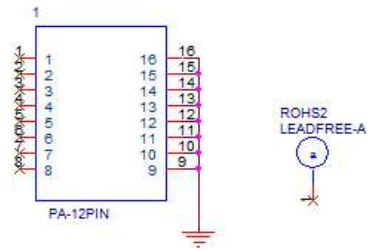
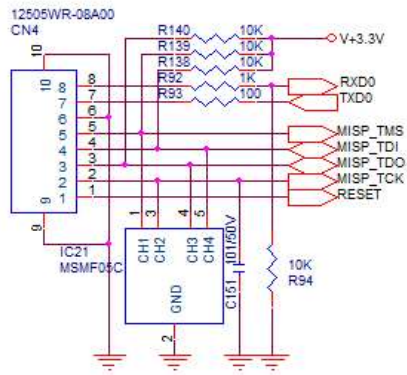
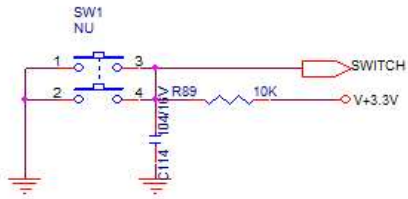
## 2-3. I/O Interface Specifications

### 2-3-1. I/O Circuit

[CMOS BD]



[DSP BD]

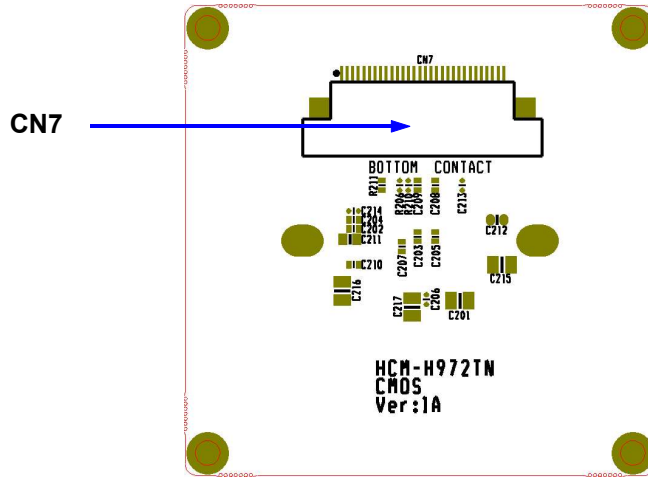


## 2-3-2. I/O Specifications





[CMOS BD Bottom]

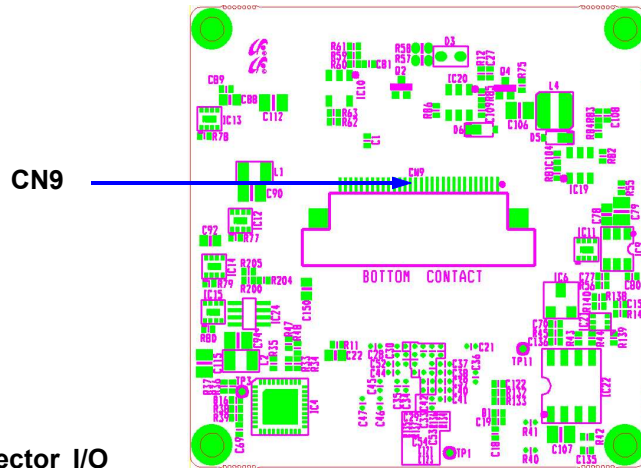


① CN7 Connector I/O

Pin NO	Pin Name	Description	Normal	Active	I/O
1	SENSOR_MOSIC	SPI CMOS Data Control Input	1.8Vp-p	1.8Vp-p	I
2	SENSOR_CSNC	SPI CMOS Chip Select Input	1.8Vp-p	1.8Vp-p	I
3	SENSOR_SCKC	SPI CMOS Data Clock Input	1.8Vp-p	1.8Vp-p	I
4	SENSOR_MISOC	SPI DSP Data Control Output	1.8Vp-p	1.8Vp-p	O
5	SENSOR_RESETNC	SPI CMOS Reset Control Input	1.8Vp-p	1.8Vp-p	I
6	EXTCLKC	SPI CMOS Video Clock Input	1.8Vp-p	1.8Vp-p	I
7	V+1.2VC	DC+1.2V Input	DC+1.2V	DC+1.2V	I
8	SENSOR_HSC	Horizontal Sync Out	1.8Vp-p	1.8Vp-p	O
9	SENSOR_VSC	Vertical Sync Out	1.8Vp-p	1.8Vp-p	O
10	V+1.8VC	DC+1.8V Input	DC+1.8V	DC+1.8V	I
11	SLVDS_D_P1C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
12	SLVDS_D_N1C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
13	GND	Board Ground	-	-	-
14	SLVDS_D_N0C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
15	SLVDS_D_P0C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
16	GND	Board Ground	-	-	-
17	SLVDS_D_P3C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
18	SLVDS_D_N3C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
19	GND	Board Ground	-	-	-
20	SLVDS_CLK_PC	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
21	SLVDS_CLK_NC	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
22	GND	Board Ground	-	-	-
23	SLVDS_D_N2C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
24	SLVDS_D_P2C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
25	GND	Board Ground	-	-	-
26	SLVDS_D_N5C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
27	SLVDS_D_P5C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O
28	V+2.8VC	DC+2.8V Input	DC+2.8V	DC+2.8V	I
29	SLVDS_D_N4C	Sub-LVDS CMOS Signal Data-1 Out	500mVp-p	500mVp-p	O
30	SLVDS_D_P4C	Sub-LVDS CMOS Signal Data+1 Out	500mVp-p	500mVp-p	O

Yeonho Electronics, 05002HR-30J05(FFC 0.5mm Pitch 30pin)

[DSP BD Top]

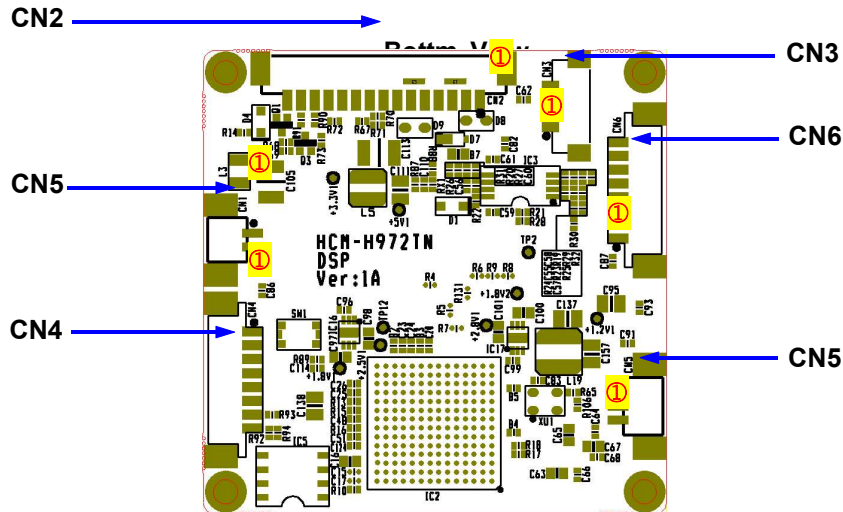


② CN9 Connector I/O

Pin NO	Pin Name	Description	Normal	Active	I/O
1	SENSOR_MOSIC	SPI CMOS Data Control Output	1.8Vp-p	1.8Vp-p	O
2	SENSOR_CSNC	SPI CMOS Chip Select Output	1.8Vp-p	1.8Vp-p	O
3	SENSOR_SCKC	SPI CMOS Data Clock Output	1.8Vp-p	1.8Vp-p	O
4	SENSOR_MISOC	SPI DSP Data Control Input	1.8Vp-p	1.8Vp-p	I
5	SENSOR_RESETNC	SPI CMOS Reset Control Output	1.8Vp-p	1.8Vp-p	O
6	EXTCLKC	SPI CMOS Video Clock Output	1.8Vp-p	1.8Vp-p	O
7	V+1.2VC	DC+1.2V Output	DC+1.2V	DC+1.2V	O
8	SENSOR_HSC	Horizontal Sync Input	1.8Vp-p	1.8Vp-p	I
9	SENSOR_VSC	Vertical Sync Input	1.8Vp-p	1.8Vp-p	I
10	V+1.8VC	DC+1.8V Output	DC+1.8V	DC+1.8V	O
11	SLVDS_D_P1C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
12	SLVDS_D_N1C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
13	GND	Board Ground	-	-	-
14	SLVDS_D_N0C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
15	SLVDS_D_P0C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
16	GND	Board Ground	-	-	-
17	SLVDS_D_P3C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
18	SLVDS_D_N3C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
19	GND	Board Ground	-	-	-
20	SLVDS_CLK_PC	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
21	SLVDS_CLK_NC	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
22	GND	Board Ground	-	-	-
23	SLVDS_D_N2C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
24	SLVDS_D_P2C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
25	GND	Board Ground	-	-	-
26	SLVDS_D_N5C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
27	SLVDS_D_P5C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I
28	V+2.8VC	DC+2.8V Output	DC+2.8V	DC+2.8V	O
29	SLVDS_D_N4C	Sub-LVDS CMOS Signal Data-1 In	500mVp-p	500mVp-p	I
30	SLVDS_D_P4C	Sub-LVDS CMOS Signal Data+1 In	500mVp-p	500mVp-p	I

Yeanho Electronics, 05002HR-30J05(FFC 0.5mm Pitch 30pin)

[DSP BD Bottom]



③ CN2 : I/O Connector -1

Pin NO	Pin Name	Description	Normal	Active	I/O
1	GND	Board Ground	-	-	-
2	V+12V	DC+12V Input	DC+12V	DC+12V	I
3	NC	No Connection	-	-	-
4	GND	Board Ground	-	-	-
5	HD-VBS	4K Composite Video Output(TVI or AHD)	1Vp-p	1Vp-p	O
6	GND	Board Ground	-	-	-
7	VBS	Composite Video Output(NTSC or PAL)	1Vp-p	1Vp-p	O
8	KEY-D	OSD Control DOWN	3.3V	0V	I
9	KEY-U	OSD Control Up	3.3V	0V	I
10	KEY-S	ADC KEY INPUT/OSD Control Enter	3.3V	ADC/0V	I
11	KEY-R	OSD Control RIGHT	3.3V	0V	I
12	KEY-L	OSD Control LEFT	3.3V	0V	I
13	VR-CONT	LED Enable Output	0V/3.3V	3.3V/0V	O
14	IR-CONT	IR/ML LED Control Output	0V/3.3V	3.3V/0V	O
15	D/N-SELI	External Day & Night Select Input	Open(3.3V)	0V	I
Yeanho Electronics, 12505WS-15A00					

④ CN4 : Connector for upgrading Camera Program

Pin NO	Pin Name	Description	Normal	Active	I/O
1	RESET	System Reset	Open	3.3V/0V	I
2	MISP_TCK	Flash Memory Clock	Open	3.3V/0V	I
3	MISP_TDO	Flash Memory Ddata Output	Open	3.3V/0V	I
4	MISP_TDI	Flash Memory Data Input	Open	3.3V/0V	I
5	MISP_TMS	Flash Memory Slect	Open	3.3V/0V	I
6	GND	Board Ground	-	-	-
7	TXD0	UART Transmit Output 0(RS232)	3.3V/0V	3.3V/0V	O
8	RXD0	UART Receive Input 0(RS232)	0V	3.3V/0V	I
Yeanho Electronics, 12505WS-08A00					

⑤ CN1 : Day & Night Motor Control Connector



Pin NO	Pin Name	Description	Normal	Active	I/O
1	MA+	Day & Night Motor Drive - Output	Open	0V/5V	O
2	MA-	Day & Night Motor Drive + Output	Open	5V/0V	O
Yeonho Electronics, 12505WS-02A00					

⑥ CN3 : Auto Iris Lens Control Connector

Pin NO	Pin Name	Description	Active	I/O
1	DAMP+	DC Iris Damping Motor +	DAMP+	O
2	DAMP-	DC Iris Damping Motor -	DAMP-	O
3	DRIVE+	DC Iris Motor Drive	DRIVE+	O
4	GND	Board GROUND	-	-
Yeonho Electronics, 12505WS-04A00				

⑦ CN5 : Extra DC+12V & Analog VBS Output

Pin NO	Pin Name	Description	Normal	Active	I/O
1	V+12V	Extra DC+12V Output(Use IR LED Board)	DC+12V	DC+12V	O
2	GND	Board GROUND	-	-	-
3	VBS	Composite Video Output(SUB1)	1Vp-p	1Vp-p	O
Yeonho Electronics, 12503WS-03A00					

⑧ CN6 : Focus/Zoom Motor Connector(Optional)

Pin NO	Pin Name	Description	Normal	Active	I/O
1	FA-	Focus A- Motor Drive Signal	Hi-Z	3.3V/0V	O
2	FA+	Focus A+ Motor Drive Signal	Hi-Z	3.3V/0V	O
3	ZA-	Zoom A- Motor Drive Signal	Hi-Z	3.3V/0V	O
4	ZA+	Zoom A+ Motor Drive Signal	Hi-Z	3.3V/0V	O
5	ZB+	Zoom B+ Motor Drive Signal	Hi-Z	3.3V/0V	O
6	ZB-	Zoom B- Motor Drive Signal	Hi-Z	3.3V/0V	O
7	FB-	Focus B- Motor Drive Signal	Hi-Z	3.3V/0V	O
8	FB+	Focus B+ Motor Drive Signal	Hi-Z	3.3V/0V	O
Yeonho Electronics, 12505WS-08A00					

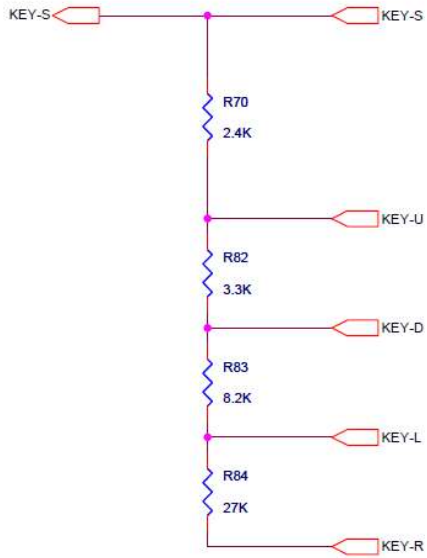


### 2-3-3. ADC KEY

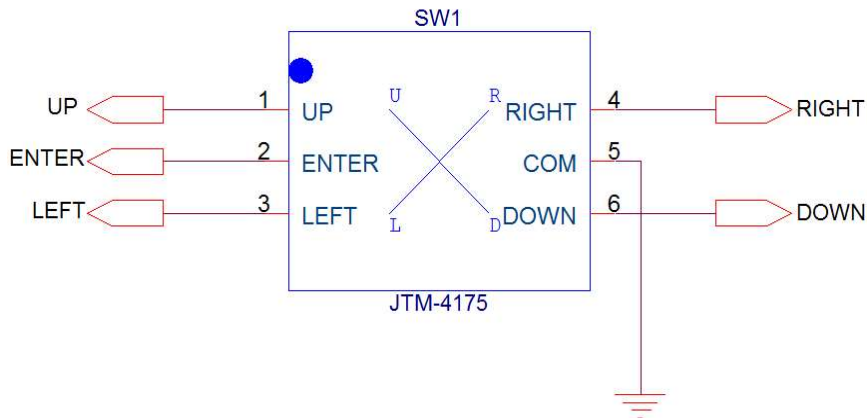
#### ① KEY-VOLTAGE

net Name	Direction	Key Name	Voltage
KEY-S	⊙	SELECT(ENTER)	0.00V
KEY-U	▲	UP	0.66V
KEY-D	▼	DOWN	1.21V
KEY-L	◀	LEFT	1.92V
KEY-R	▶	RIGHT	2.65V

#### ② Internal/External Circuit



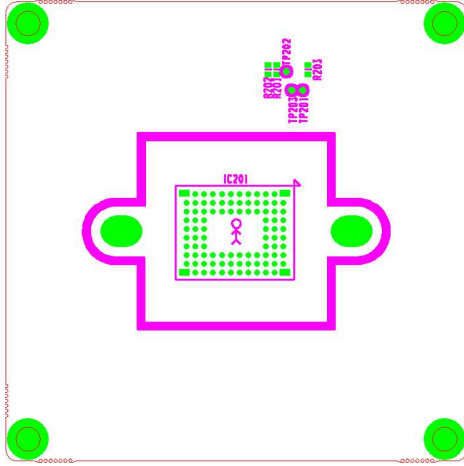
#### ③ External Switch(Sample)



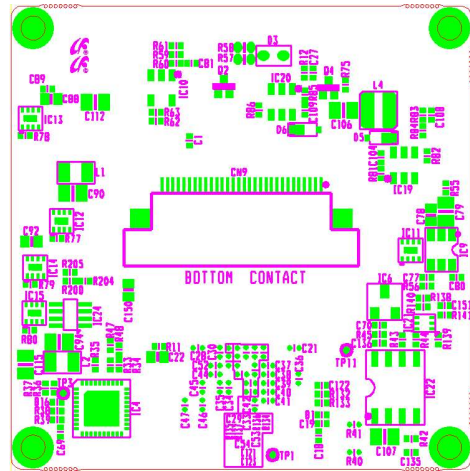


## 2-3-4. PCB Layout

### <TOP VIEW>

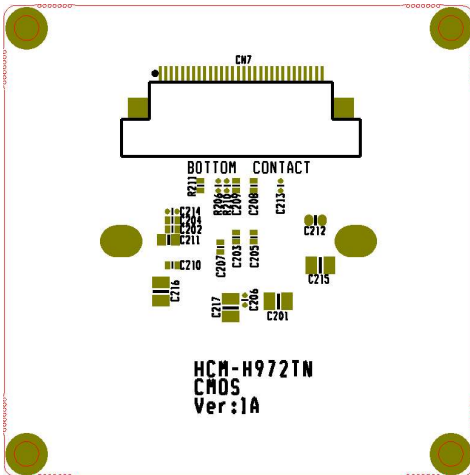


[CMOS]

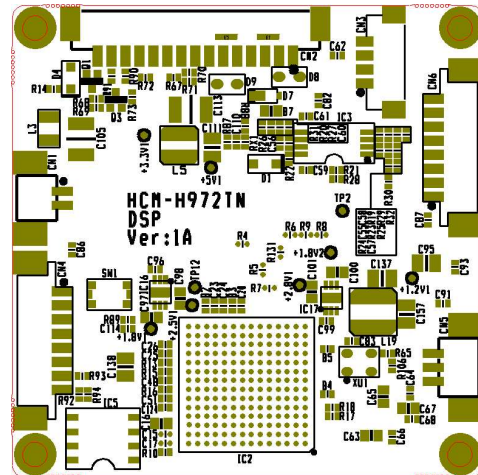


[DSP]

### <BOTTOM VIEW>



[CMOS]



[DSP]





## 2-5. OSD Menu tree

Main Menu	Sub Menu	Descriptions
EXSPOSURE	AF MODE	AUTO,SHUTFIX,AGCFIX,MANUAL
	SHUTTER	AUTO, 1/30, 1/60, 1/120, 1/180,...,1/10000
	IRIS	Not Avable
	AGC	Not Avable
	AGC MAX	OFF, LOW, MID, HIGH, DMIN, DMID, DMAX
	SENS UP	Not Avable
	AE BRIGHT	0~20
WHITE BALANCE	MODE	0ATW,ONEPUSH,INDOOR,OUTDOOR,MANUAL
	PUSH	PRESSOK, WAIT
	BLUE	0~100
	RED	0~100
	SPEED	0~7
	OFFSET-B	0~100
	OFFSET-R	0~100
DAY & NIGHT	MODE	AUTO, DAY(COLOR), NIGHT(BW), EXT
	DELAY(SEC)	0~60
	D->N LEVEL	0~255
	N->D LEVEL	0~255
	NIGHT COLOR	OFF, ON
	COLOR BURST	OFF, ON
DNR	DNR MODE	OFF, 2D, 3D, 2D+3D
	DNR LEVEL	AUTO, LOW, MID, HIGH
	DNR APERTURE	0~4
PRIVACY MASK	MODE	OFF, ON
	TYPE	SQUARE, POLYGON
	MASK NO	MASK1~MASK4
	DISPLAY	OFF, ON
	COLOR	BLK, WHIT, GRN, BLU, RED, CYN, MAG, EYL,GRAY-
	POLY SELECT	L-TOP, R-TOP, L-BOTTOM, R-BOTTOM
	POSITION-X	0~216
	POSITION-Y	0~216
	DEFAULT	#





Main Menu	Sub Menu	Descriptions
EFFECT	LENS SHADING	OFF, ON
	GAMMA CORRECT	OFF,ON
	CONTRAST	0~20
	BRIGHTNESS	0~20
	SATURATION	0~20
	HUE	0~20
	EDGE ENHANCE	0~20
	AUTO SATURATION	OFF, LOW, MID, HIGH
	AUTO EDGE	OFF, ON
	DEFAULT	#
SPECIAL	DZOOM	OFF, ON
	DEFOG	AUTO, OFF, ON
	DWDR	AUTO, OFF,ON
	MOTION DETECT	OFF, ON
	DIS	OFF, ON
	BACK LIGHT	OFF, BLC,HML
	BINNING	OFF, ON
	DEFECT PIXEL	OFF, ON, STATIC, ON(FIX)
	DISP-FUNCTION	#
	WDR	Not Avable
	FLICKER DETECT	OFF,ON
SETUP	CAM TITLE	OFF, ON
	NTSC/PAL	NTSC, PAL
	RS485	Not Avable
	LANGUAGE	Not Avable
	MENU COLOR	#
	FACTORY RESET	#
	SYSTEM INFO	#
	MENU POSITION	DEFAULT, TOP-L, TOP-R, BOTTOM-L, BOTTOM-R
	OUTPUT FORMAT	4K3840H15, 4M1440p30, 4M1440p25, 1080p30, 1080p25



## 2-6 OSD Menu Functions

### ◆ Main Menu



#### ■ EXPOSURE

Adjust camera exposure.

#### ■ WHITE BALANCE

This function is used to set the White Balance operation which adjusts the color scheme.

#### ■ DAY&NIGHT

The function is used to set the Day/Night function which switches day/Night mode automatically based on the level of illumination.

#### ■ DNR

The function is used to reduce the noise using the Digital Noise Reduction (DNR).

#### ■ PRIVACY

This function is used to set the masked area on the screen.

#### ■ EFFECT

This function is use to set the lens shading, Gamma correction, contrast, brightness, etc

#### ■ SPECIAL

The function is used to set the dzoom, defog, dwdr, motion detection, etc

#### ■ SETUP

The function is used to configure the camera title, ntsc/pal, menu color, menu position, and output format.

#### ■ EXIT

The function is used to save the various settings of the internal OSD menu. and exit the menu.

### KEY FUNCTIONS

- ▲: Up
- ▼: Down
- ◀: Left
- ▶: Right
- Ⓢ: Enter(Setup)



## ◆ EXPOSURE

This function can adjust the intensity of radiation incoming to the camera.

Use the "▲" "▼" "◀" "▶" "Ⓢ" switch to select a menu item.



FUNCTION	OPTION	DESCRIPTION
AE MODE	AUTO, SHUTFIX, AGCFIX, MANUAL	Sets the exposure mode
SHUTTER	AUTO, 1/30, 1/60, 1/120,	sets the Shutter speed when manual shutter operation.
IRIS	Not Avable	Iris contorl value
AGC	Not Avable	Agc minimum value
AGC MAX	OFF, LOW, MID, HIGH, DMIN, DMID, DMAX	Agc maximun value
SENS UP	Not Avable	Sens up vlaue
AE BRIGHT	0~20	exposure target value

## ◆ WHITE BALANCE





FUNCTION	OPTION	DESCRIPTION
MODE	0ATW,ONEPUSH,INDOO ,OUTDOOR,MANUAL	Sets the white balance mode
PUSH	PRESSOK, WAIT	use the onepush mode
BLUE	0~100	use the manual mode
RED	0~100	use the manual mode
SPEED	0~7	set the white balance track speed in atw mode
OFFSET-B	0~100	use the atw mode (blue-hue)
OFFSET-R	0~100	use the atw mode (red-hue)

## ◆ DAY&NIGHT

```

DAY & NIGHT
*MODE          EXT
DELAYISEC J
D->N LEVEL
N->D LEVEL
NIGHT COLOR   OFF
COLOR BURST   OFF
RETURN
  
```

FUNCTION	OPTION	DESCRIPTION
MODE	AUTO, DAY(COLOR), NIGHT(BW), EXT	Sets the day&night mode
DELAY(SEC)	0~60	Sets the Night/Day identification transfer time.
D->N LEVEL	0~255	Sets the threshold level from day to night change
N->D LEVEL	0~255	Sets the threshold level from night to day change
NIGHT COLOR	OFF, ON	use the color image at night
NIGHT BURST	OFF, ON	set the night burst on/off.



## ◆ DNR

```

NOISE REDUCTION
*DNR MODE      2D+3D
DNR LEVEL     AUTO
DNR APERTURE   2
RETURN
  
```

FUNCTION	OPTION	DESCRIPTION
DNR MODE	OFF, 2D, 3D, 2D+3D	Sets the dnr mode
DNR LEVEL	AUTO, LOW, MID, HIGH	Sets the Dnr weight.
DNR APETURE	0~4	Sets the aperture value(edge compensation)

## ◆ PRIVACY MASK

```

PRIVACY MASK
*MODE          OFF
TYPE
MASK NO.
DISPLAY
COLOR
POLY SELECT
POSITION-X
POSITION-Y
SIZE-X
SIZE-Y
DEFAULT
RETURN
  
```

FUNCTION	OPTION	DESCRIPTION
MODE	OFF, ON	Sets the privacy mode
TYPE	SQUARE, POLYGON	Selects the mask type.
MASK NO	MASK1~MASK4	Sets the mask number
DISPLAY	OFF, ON	selects the use or no use
COLOR	BLK, WHIT, GRN, BLU, RED, CYN, MAG, EYL,GRAY-1~6,MOSA	selects the mask color
POLY SELECT	L-TOP, R-TOP, L- BOTTOM, R-BOTTOM	sets the mask positon and size when polygon type



POSITION-X	0~216	sets the mask position-x
POSITION-Y	0~216	sets the mask position-y
DEFAULT	#	return to the default value

## ◆ EFFECT



FUNCTION	OPTION	DESCRIPTION
LENS SHADING	OFF, ON	Select the lens shading on/off.
GAMMA CORRECT	OFF, ON	Select the Gamma curves
CONTRAST	0~20	Sets the contrast value
BRIGHTNESS	0~20	Sets the video output level
SATURATION	0~20	Sets the color gain
HUE	0~20	Sets the color vector value
EDGE ENHANCE	0~20	Sets the image edge enhance value
AUTO SATURATE	OFF, LOW, MID, HIGH	Sets the color sub gain
AUTO EDGE	OFF, ON	Sets the edge compensation
DEFAULT	#	return to the default value



## ◆ SPECIAL

```

SPECIAL
* DZOOM          OFF
DEFOG           OFF
DWDR            OFF
MOTION DETECT  OFF
DIS            OFF
BACKLIGHT      OFF
BINNING        OFF
DEFECT PIXEL   ON(FIXED)
DISP. FUNCTION  >
WDR            OFF
FLICKER DETECT OFF
RETURN
  
```

FUNCTION	OPTION	DESCRIPTION
DZOOM	OFF, ON	Select the dzoom on/off.
DEFOG	AUTO, OFF, ON	Select the defog mode
DWDR	AUTO, OFF,ON	Sets the digital wide dynamic range mode
MOTION DETEC	OFF, ON	Sets the motion detection on/off
DIS	OFF, ON	Sets the digital image stabilization on/off
BACKLIGHT	OFF, BLC,HML	Sets the backlight mode
BINNING	OFF, ON	Sets the binning on/off
DEFECT PIXEL	OFF, ON, STATIC, ON(FIX)	executes the defect pixel compensation
DISP-FUNCTION	#	Sets the freeze,mirror, rotation etc,
WDR	Not Avable	wide dynamic range compensation
FLICKER DETEC	OFF,ON	Select the flicker compensation on/off



## ◆ SETUP

```

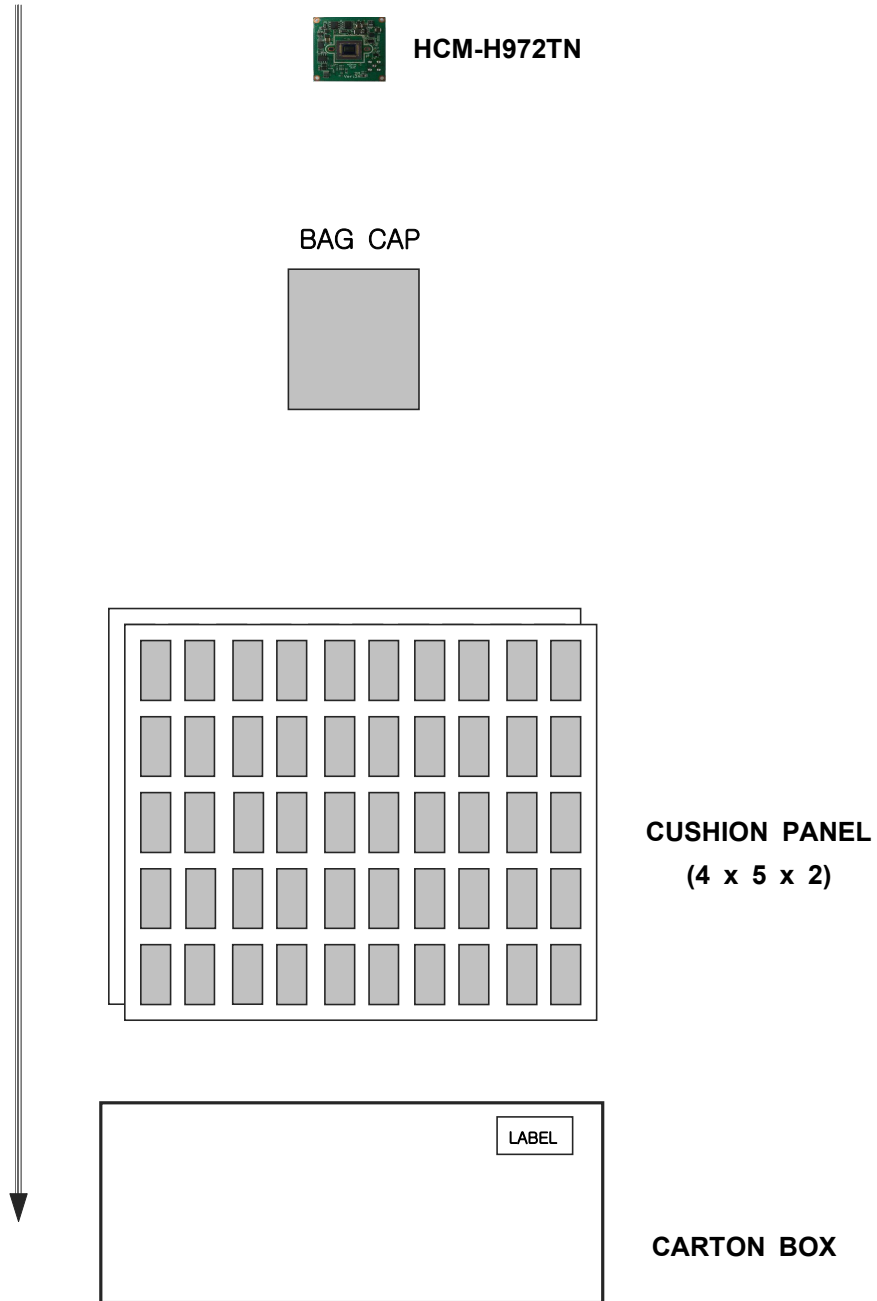
SETUP
*CAM TITLE      OFF
NTSC/PAL        NISC
RS485
LANGUAGE
MENU COLOR      >
FACTORY RESET   >
SYSTEM INFO     >
MENU POSITION    DEFAULT
OUTPUT FORMAT   4K3840H15>
RETURN
  
```

FUNCTION	OPTION	DESCRIPTION
CAM TITLE	OFF, ON	Sets the camera title
NTSC/PAL	NTSC, PAL	Sets the cvbs output format
RS485	Not Avable	Set the rs485
LANGUAGE	Not Avable	Sets the menu language
MENU COLOR	#	Sets the menu osd color
FACTORY RESET	#	the all menu return to factory value
SYSTEM INFO	#	display the system information
MENU POSITION	DEFAULT, TOP-L, TOP-R, BOTTOM-L, BOTTOM-R	Sets the menu position
OUTPUT-FORMAT	4K3840H15, 4M1440p30, 4M1440p25, 1080p30, 1080p25	Selects the video format





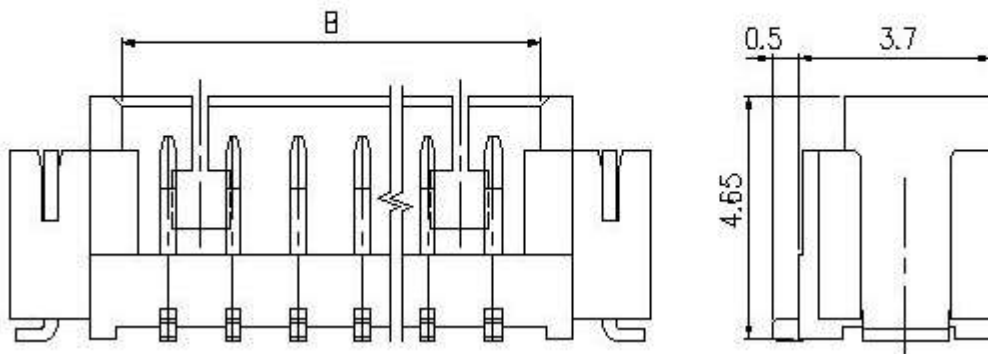
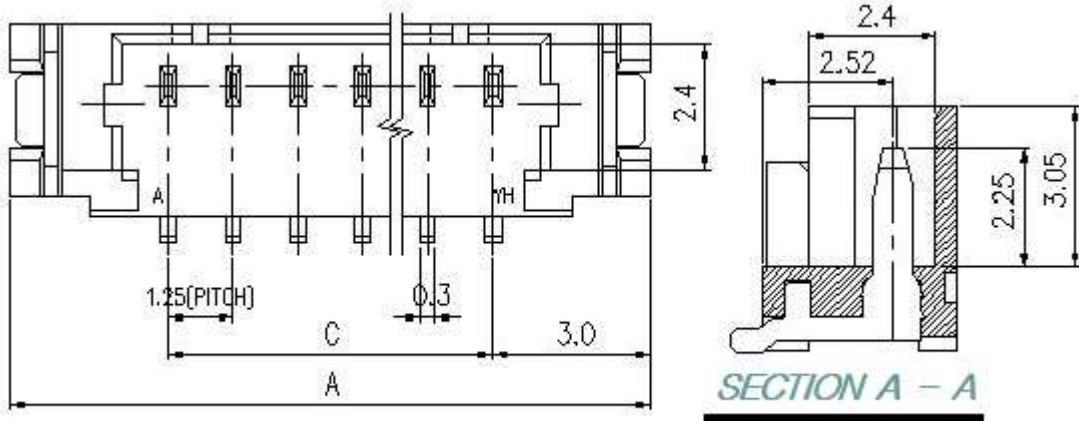
### 3. Packing Information





## 4. Reference Data Sheet

### 4-1. 12505WS-XXA00 Series



#### Available Pin

PARTS NO.	A	B	C
12505WS-02	7.25	3.05	-
12505WS-03	8.50	4.30	2.50
12505WS-04	9.75	5.55	3.75
12505WS-05	11.00	6.80	5.00
12505WS-06	12.25	8.05	6.25
12505WS-07	13.50	9.30	7.50
12505WS-08	14.75	10.55	8.75
12505WS-09	16.00	11.80	10.00
12505WS-10	17.25	13.05	11.25
12505WS-11	18.50	14.30	12.50
12505WS-12	19.75	15.55	13.75
12505WS-13	21.00	16.80	15.00
12505WS-14	22.25	18.05	16.25
12505WS-15	23.50	19.30	17.50

#### Specification

ITEM	SPEC
Voltage Rating	AC/DC 125V
Current Rating	AC/DC 1A
Operating Temperature	-25°C~+85°C
Contact Resistance	30mΩ MAX
Withstanding Voltage	AC250V/1min
Insulation Resistance	100MΩ MIN
Applicable Wire	-
Applicable P.C.B	0.8 ~ 1.6mm
Applicable FPC/FFC	-
Solder Height	0.15mm
Crimp Tensile Strength	-
UL FILE NO	E108706