

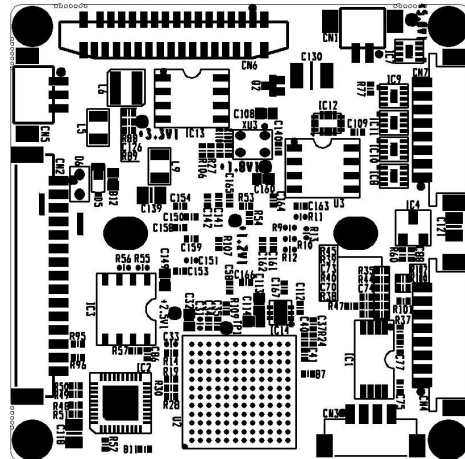
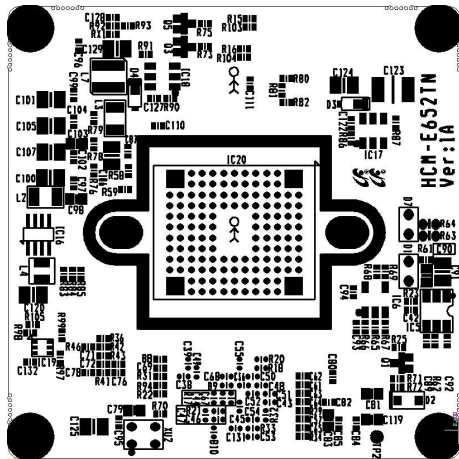


CUSTOMER	
ATTENTION 1	2.13M CMOS
ATTENTION 2	42x42mm
MODEL	HCM-E652TN
CODE NO	

2M TVI/AHD/VBS/BT1120 Color Camera Module(1/2")

SPECIFICATIONS

JUN. 04. 2018



P&A Corporation



Table of Contents

- Revision History

1. Features	4
2. Applications & Information	
2-1. General Specifications & Functions	6
2-2. Block Diagram	7
2-3. I/O Interface Specifications	
2-3-1. I/O Circuit	8
2-3-2. I/O Specifications	9
2-3-3. ADC Key	12
2-3-4. PCB Layout	13
2-4. PCB Outline Dimensions	14
2-5. OSD Menu tree	15
2-6. OSD Menu Functions	17
3. Packing Information	24



- Revision History

Date	Version	Description
May.18 2018	0A	Establishment



1. Features

■ 1/1.8" 3.19 MEGA SONY CMOS

High definition 12-bit digital image signals offering 3.19 mega pixels are obtained with high speed of 30 fps (LVDS 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

This camera has realized high resolution of 1920x1080 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 which is used with multi language. And so, the camera can be controlled by selecting text displayed on the monitor screen.



■ Privacy Mask Function (8areas ,rectangle & polygon)

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 8 point rectangle mask or 8 point polygon mask, which is overlaid onto the video signal output.



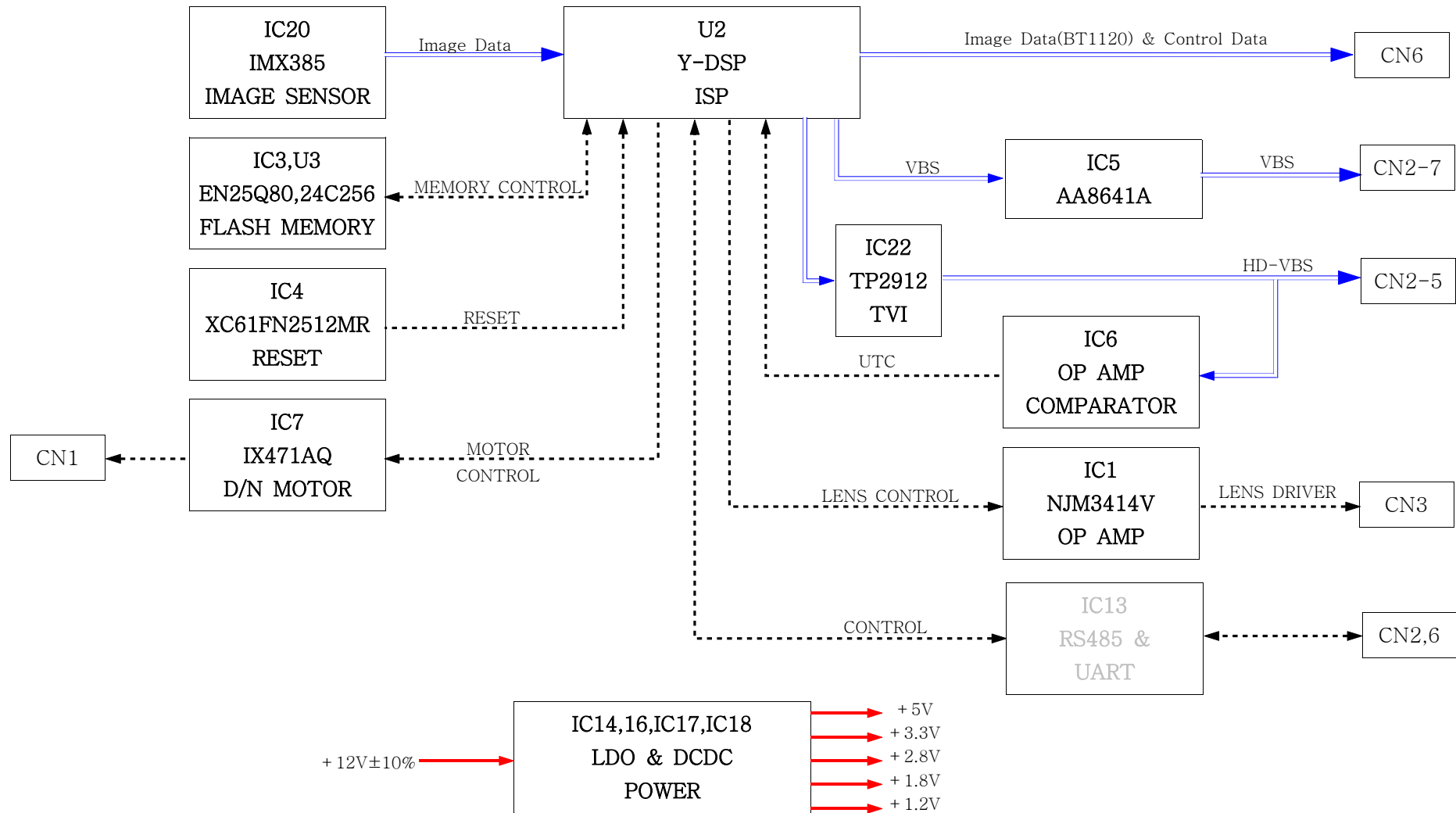
2. Applications & Information

2-1. General Specifications & Functions

Items	Sub-items	HCM-E652TN
CMOS	Device	1/2" 2.13MEGA CMOS(IMX385LQR)
	Total	1952 (H) × 1113 (V)
	Effective	1945 (H) × 1097 (V)
Performance	Horizontal/Vertical Resolution	1920/1080 Pixels
	Minimum illumination (F1.2, AGC Max)	Color : TBD Lux(50IRE) / TBD Lux(15IRE) B/W : TBD Lux(50IRE) / TBD Lux(15IRE)
	S/N Ratio	TBD
	Frame	30fps HD
Functions	OSD	English
	Day&Night	Auto/Color/B&W/EXTERN
	ATW	1800 ~ 10500K
	High Speed Shutter	1/30(1/25) ~ 1/10Ksec
	WDR	NA
	D-WDR	Off/ON
	BLC	Off/ON (Size, Position)
	HLC	Off/ON(Level Setting(0~20), Color)
	AGC	Off/Low/Mid/High/DMin/DMid/DMax
	Camera Title	Off/On (Letters A~Z, Numerals 0~9, Symbols)
	White Balance	AUTO / PUSH / INDOOR/ OUTDOOR /MANUAL
	DNR	2D+3DNR
	Motion Detection	Off/ON(4 Area)
	Privacy Mask	8 Areas(Rectangle & Polygon)
	Sens-Up	x2~x10, x12, x15
De-Fog	Off/ON	
Etc. Function	Sharpness, Contrast	0~20
	Brightness, Hue	0~20
	In/Output	Ext IR Mode, IR LED
	UTC	Pelco-C
Video Output	Analog Video Output(NTSC/PAL)	Analog VBS 1.0Vp-p (75ohm Terminated)
	HD Analog Video Output(Selectable)	TVI VBS 1.0Vp-p (75ohm Terminated)
		AHD VBS 1.0Vp-p (75ohm Terminated)
Lens	Iris	DC iris(Galvanometer)
	TDN	Day & Night(Galvanometer)
Power Consumption		DC 12V±10%, Less than 3.4 Watts
Operating Temperature		Absolute : -10°C ~ +50°C
Operating Humidity		Less than 90%
Dimension		42mm x 42 mm x 1.0t



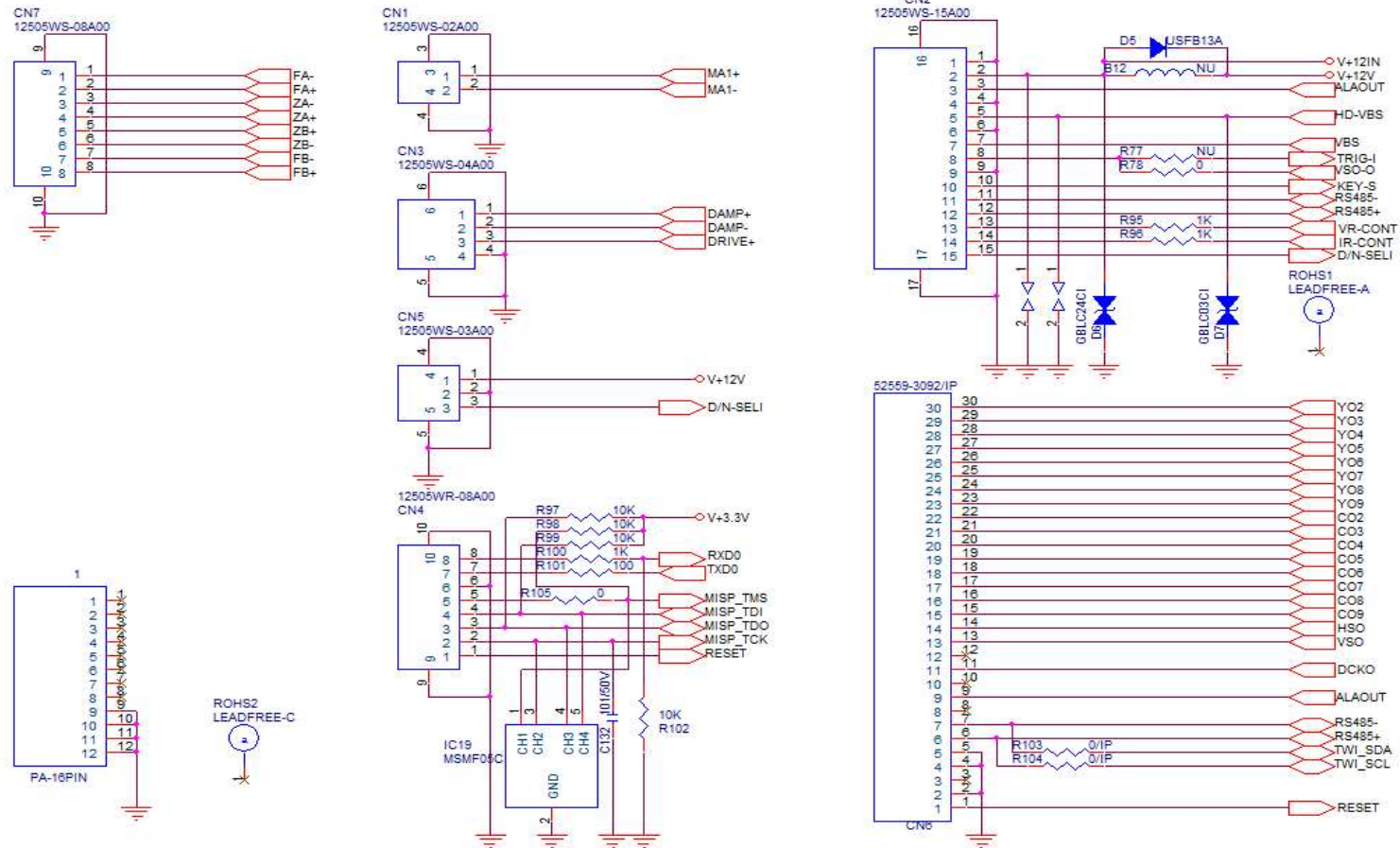
2-2. Block Diagram





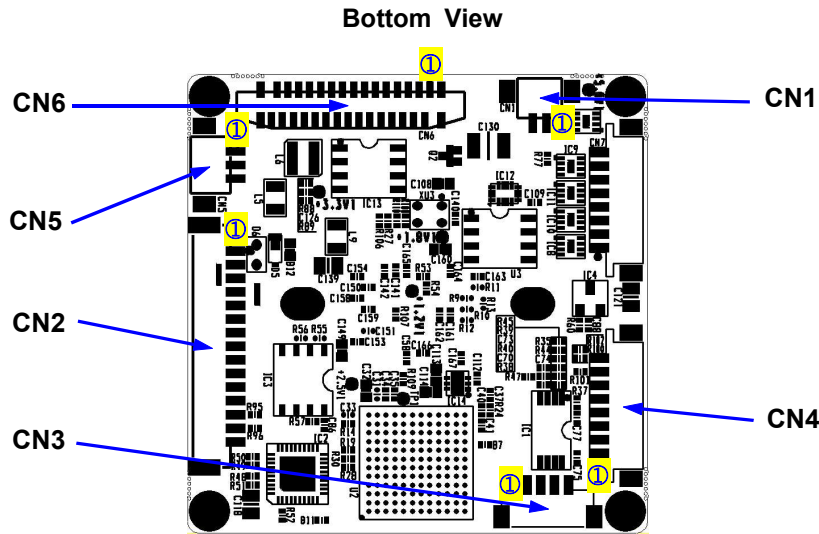
2-3. I/O Interface Specifications

2-3-1. I/O Circuit





2-3-2. I/O Specifications



① 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	ALAO	Alarm Out	Open	0V	O
4	GND	Board Ground	-	-	-
5	HD-VBS	2M 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	VSO-O	Vertical Sync Output	Pulse	Pulse	O
9	GND	Board Ground	-	-	-
10	KEY-S	ADC KEY INPUT	3.3V	ADC/0V	I
11	RS485-	RS485- Signal(UART Rx)	-	Pulse	I/O
12	RS485+	RS485+ Signal(UART Tx)	-	Pulse	I/O
13	VR-CONT	Visible Light LED Control Output	0V/3.3V	3.3V/0V	O
14	IR-CONT	Day & Night Control Output	0V/3.3V	3.3V/0V	O
15	D/N-SELI	External Day & Night Select Input	Open(3.3V)	0V	I
Yeonho Electronics, 12505WS-15A00					

② CN4 : Connector for upgrading Camera Program

Pin NO	Pin Name	Description	Normal	Active	I/O
1	RESET	System Reset	3.3V	0V	I
2	MISP_TCK	Flash Memory Clock		Pulse	I
3	MISP_TDO	Flash Memory Data Output		Pulse	O
4	MISP_TDI	Flash Memory Data Input		Pulse	I
5	MISP_TMS	Flash Memory Chip Select		Pulse	I
6	GND	Board Ground	-	-	-
7	TXD0	Consol UART Rx	-	Pulse	I/O
8	RXD0	Consol UART Tx	-	Pulse	I/O
Yeonho Electronics, 12505WS-08A00					



③ 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					

④ 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				

⑤ CN5 : Extra DC+12V / D&N Contro Input

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	D/N-SELI	External Day & Night Select Input	Open(3.3V)	0V	I
Yeonho Electronics, 12503WS-03A00					



⑦ CN6 : Digital Output BT.1120

Pin NO	Pin Name	Description	Normal	Active	I/O
30	Y02	Parallel digital Output Image Y Data2		TTL	O
29	Y03	Parallel digital Output Image Y Data3		TTL	O
28	Y04	Parallel digital Output Image Y Data4		TTL	O
27	Y05	Parallel digital Output Image Y Data5		TTL	O
26	Y06	Parallel digital Output Image Y Data6		TTL	O
25	Y07	Parallel digital Output Image Y Data7		TTL	O
24	Y08	Parallel digital Output Image Y Data8		TTL	O
23	Y09	Parallel digital Output Image Y Data9		TTL	O
22	C02	Parallel digital Output Image C Data2		TTL	O
21	C03	Parallel digital Output Image C Data3		TTL	O
20	C04	Parallel digital Output Image C Data4		TTL	O
19	C05	Parallel digital Output Image C Data5		TTL	O
18	C06	Parallel digital Output Image C Data6		TTL	O
17	C07	Parallel digital Output Image C Data7		TTL	O
16	C08	Parallel digital Output Image C Data8		TTL	O
15	C09	Parallel digital Output Image C Data9		TTL	O
14	HSO	Vertical sync In-Out mode		TTL	O
13	VSO	Horizontal sync In-Out mode		TTL	O
12	NC	No connection	-	-	-
11	DCKO	Output Pixel Clock		TTL	O
10	NC	No connection	-	-	-
9	ALAOOUT	Alarm Output	OPEN	0V	O
8	KEY-S	OSD Control A/D Key Input	3.3V	x.xV	I
7	RS485+(SDA)	RS485-A Format(I ² C DATA)			I/O
6	RS485-(SCL)	RS-485-B Format(I ² C CLOCK)			I/O
5	GND	Board GROUND	-	-	-
4	GND	Board GROUND	-	-	-
3	V+12V	DC +12V Input/Output	-	+12V	I/O
2	GND	Board GROUND	-	-	-
1	RESET	Main Reset	3.3V	0V	I/O
Molex 52559-3092					

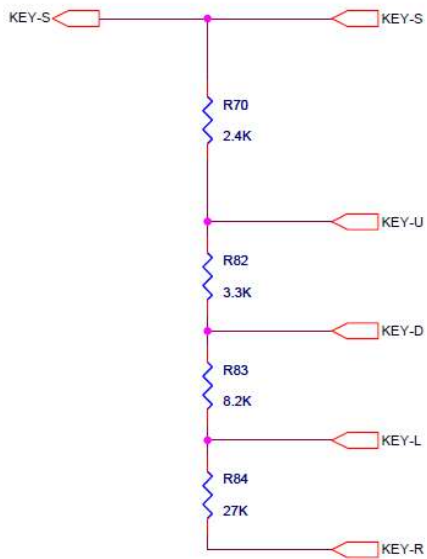


2-3-3. ADC KEY

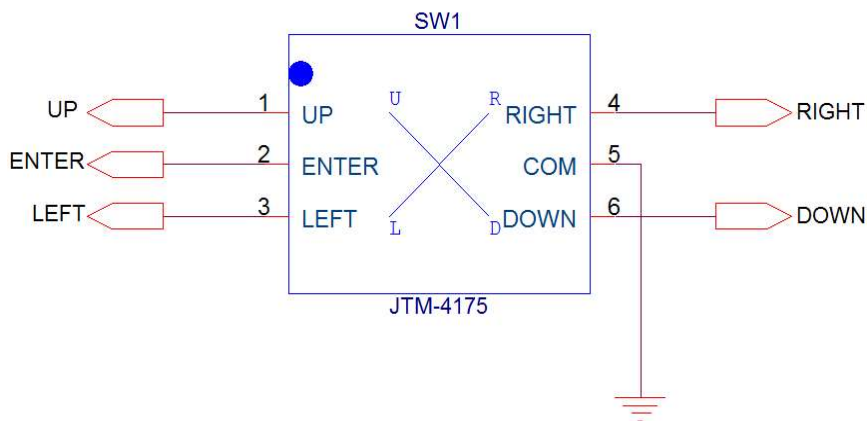
① KEY-VOLTAGE

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



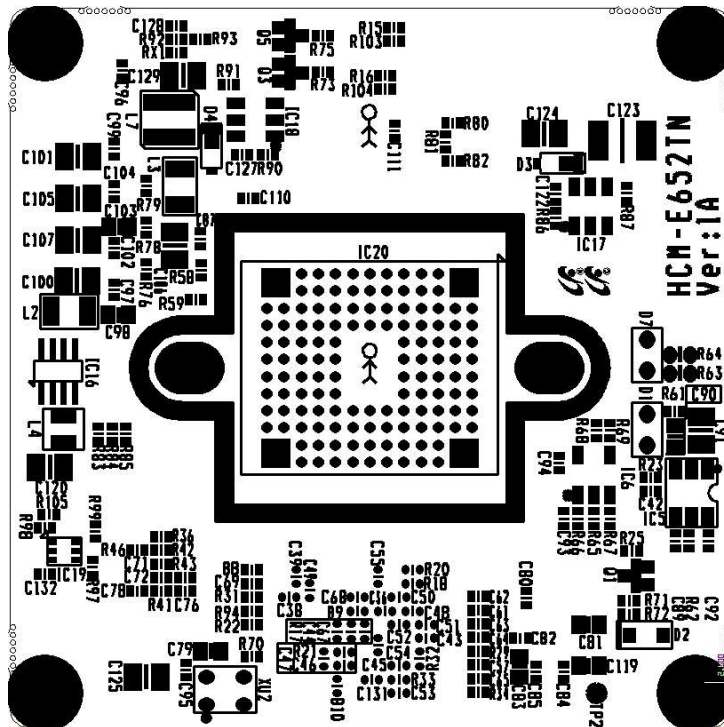
③ External Switch(Sample)



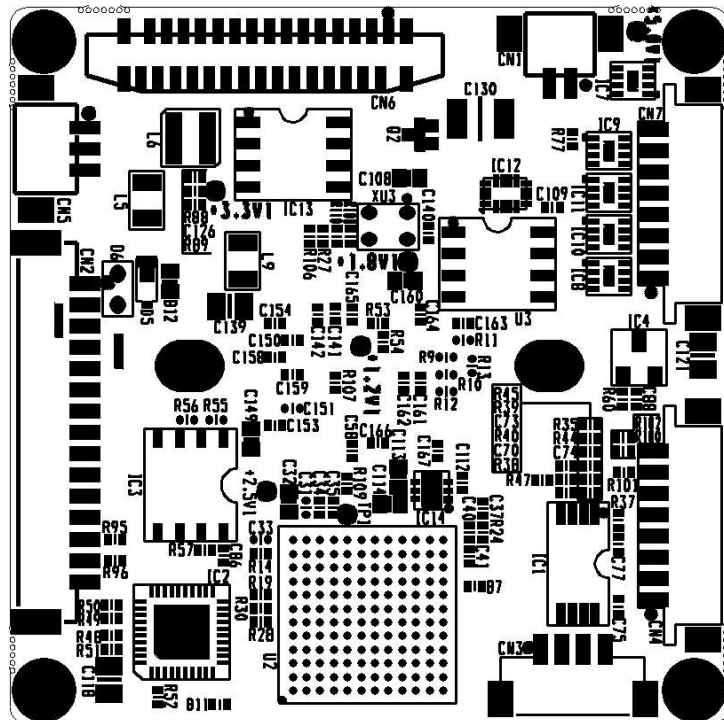


2-3-4. PCB Layout

<TOP VIEW>

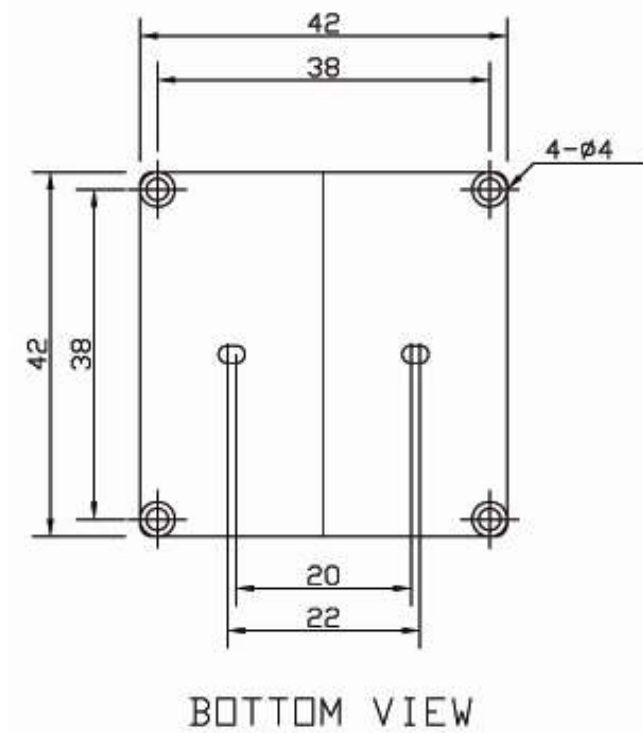
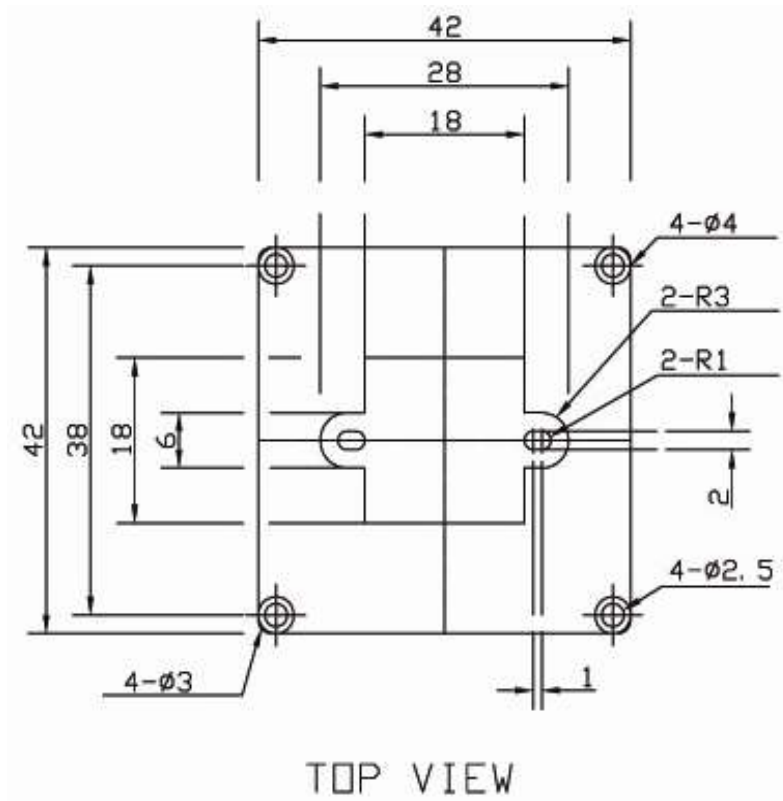


<BOTTOM VIEW>





2-4. PCB Outline Dimensions





2-5. OSD Menu tree

Main Menu	Sub Menu	Descriptions
FOCUS	AF MODE	AUTO,MANUAL
	SCANNING	HALF,FULL
	ONE PUSH	PRESS OK
	SYNC TDN	OFF,ON
	INITIAL	PRESS OK
EXPOSURE	AE 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
	FLK CONTROL	AUTO, ON, OFF
	LENS MODE	INDOOR, OUTDOOR, MANUAL
WHITE BALANCE	MODE	ATW, ONEPUSH,INDOOR,OUTDOOR,MANUAL
	PUSH	PRESS OK, 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 APRETURE	0~4
PRIVACY MASK	MODE	0~3
	TYPE	OFF,ON
	MASK NO	0~80
	DISPLAY	0~45
	COLOR	0~80



Main Menu	Sub Menu	Descriptions
PRIVACY MASK	POLY SELECT	0~45
	POSITION-X	0~10
	POSITION-Y	OFF, ON
	DEFAULT	#
EFFECT	LELNS SHADING	OFF, ON
	GAMMA CORRECT	OFF, ON
	CONTRAST	0~20
	BRIGHT	0~20
	SATURATION	0~20
	HUE	0~20
	EDIG 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	1080p30, 1080p25, 720p60, 720p50	



2-6 OSD Menu Functions

◆ Main Menu



■ FOCUS

Select the Auto Focus Item for 2-Motor

■ 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)



◆ FOCUS



FUNCTION	OPTION	DESCRIPTION
AF MODE	AUTO MANUAL	Executes the Auto Focus after Zoom in/out Focus the subjects manually
SCANNING	HALF FULL	Scan the half focus boundary Scan the full focus area
ONE PUSH	ON	Executes the Auto Focus just one time
SYNC TDN	OFF, ON	Execute the Auto Focus when changing the TDN
INITIAL	ON	Check the Zoom and Focus position

◆ 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, 1/180, ..., 1/1000	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 brightness



◆ WHITE BALANCE



FUNCTION	OPTION	DESCRIPTION
MODE	ATW, ONEPUSH, INDOOR,OUTDOOR, MANUAL	Sets the white balance mode
PUSH	PRESET OK, 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



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 APERTURE	0~4	Sets the aperture value(edge compensation)

◆ PRIVACY MASK

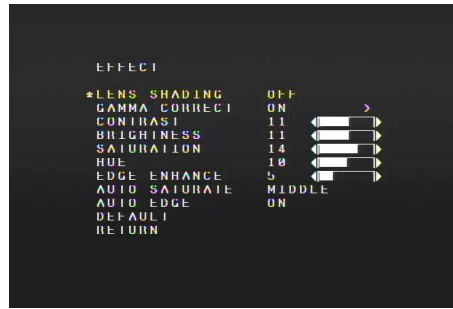
```

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, LBOTTOM, R-BOTTOM	sets the mask positon and size when polygon type
POSITION-X	0~21	sets the mask position-x
POSITION-Y	0~21	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

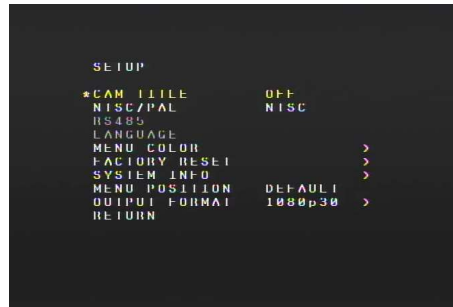
```

SPECIAL
*DZOOM          OFF
DEFOG           OFF
DWDR            OFF
MOTION DETECT  OFF
DIS             OFF
BACKLIGHT      OFF
BINNING         OFF
DEFECT PIXEL   ON
DISP. FUNCTION ON
WDR             OFF
FLICKER DETECT ON
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



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
OUTPUTFORMAT	1080p30,1080p25, 720p60, 720p50	Selects the video format



3. Packing Information

