

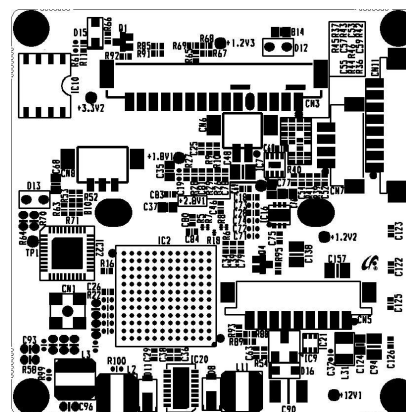
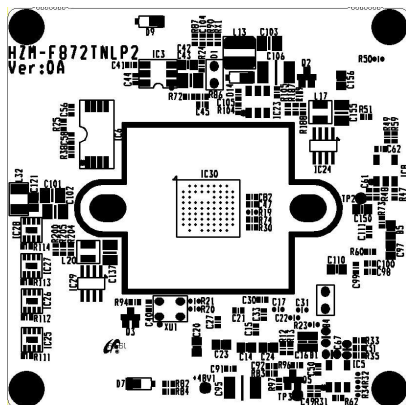


<b>CUSTOMER</b>	
<b>ATTENTION 1</b>	<b>5M CMOS</b>
<b>ATTENTION 2</b>	<b>42x42mm</b>
<b>MODEL</b>	<b>HCM-F872TNL</b>
<b>CODE NO</b>	

4M EX-SDI/TVI/AHD/VBS Color Camera Module

# SPECIFICATIONS

APR. 03. 2018



P&A Corporation



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## - Revision History

Date	Version	Description
APR.03 2018	0A	Establishment



## 1. Features

### ■ 1/2.7" 5 MEGA OMNI-VISION CMOS

High definition 12-bit digital image signals offering 6.87 mega pixels are obtained with high speed of 60 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 3096x2218 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.

### ■ SMART IR & WDR

Brightness of IR and saturation phenomenon are automatically adjusted. Multiple exposure WDR(Wide Dynamic Frange)

### ■ 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 (box: 16 area, polygon: 8ea)

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



## ■ Use 2-Motor Lens

- Auto Focus : When the camera zooms IN / OUT, the focus is then automatically engaged. In addition, even when the Day & Night performed, and the focus then automatically engaged.
- Manual Zoom In/Out : When the user wants to control the camera more precise zoom and focus, manual control is possible.
- One Push AF : While viewing the camera image, when you need to correct the focus, the use of this feature, it is possible to obtain a better image.

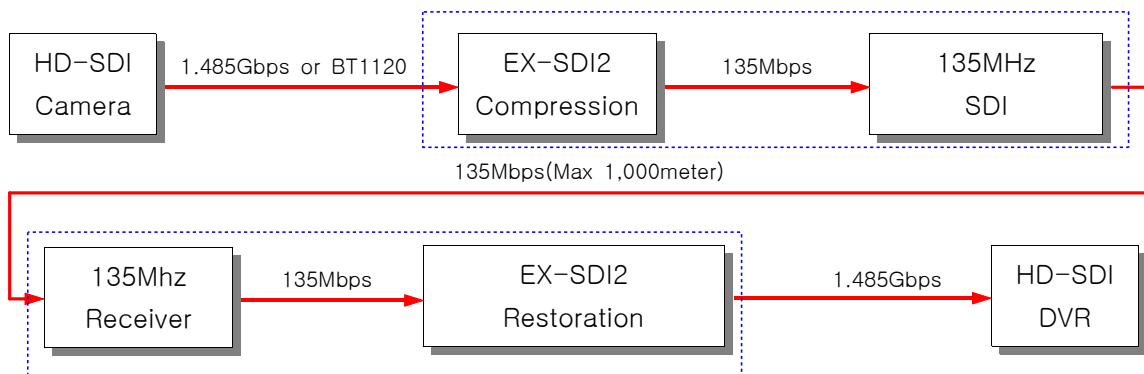
## ■ EX-SDI (HD-VLC : Long Reach Solution) & UTC, PoC

# This camera supports the EX-SDI2™(Long Reach Solution). The EX-SDI is no loss of up to 1,000m (warranty 600m) to HD-SDI (1.5GHz) is a revolutionary technology that can be transferred.

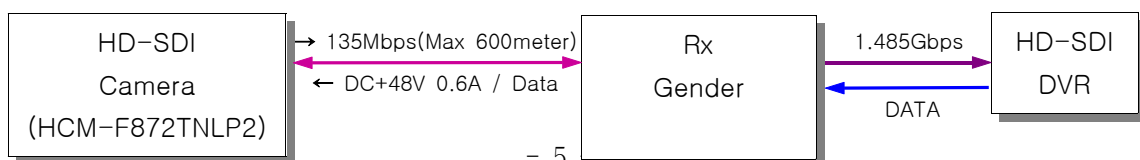
# The technical background EX-SDI2 : HD-SDI video signal is compressed and then lowered the frequency of 135Mhz to transfer technology to increase the distance almost no loss of image.

# This camera sends video signals to the coaxial cable and sends power and data at the same time. It uses + 48V DC power and can transmit up to 600 meters with 0.6A capacity.

### <BLOCK DIAGRAM>



### <PoC System Diagram>





↑  
DC+48V

<Cable Reach>

Cable Reach In Makers			
Cable Type	HD-VLC : 270Mb/s	HD : 1.485Gb/s	Full HD : 2.97Gb/s
belden 9292(RG11) 14AWG	675	335	220
Belden 7731a(rg11) 14AWG	670	330	220
Amphenol 5C-HFBT 16AWG	490	245	160
Belden 1694A 18AWG	460	230	150
West Penn 815 20AWG	535	215	140
Betden RG6(82248) 18AWG	375	185	120
West Penn 252815 20AWG	345	170	110
Belden RG59(543945) 20AWG	330	160	100
Belden 1426A(RG59)20AWG	330	160	100
Belden 1855A 23AWG	235	115	75
JYEBAO RG59B/U 23AWG	220	110	70
Canare 3C2V 25AWG	190	95	60

# Always, the core wire of the cable must be 100% copper. If the core of the cable when using a cable that is coated on copper aluminum, it has reached a distance shorter.



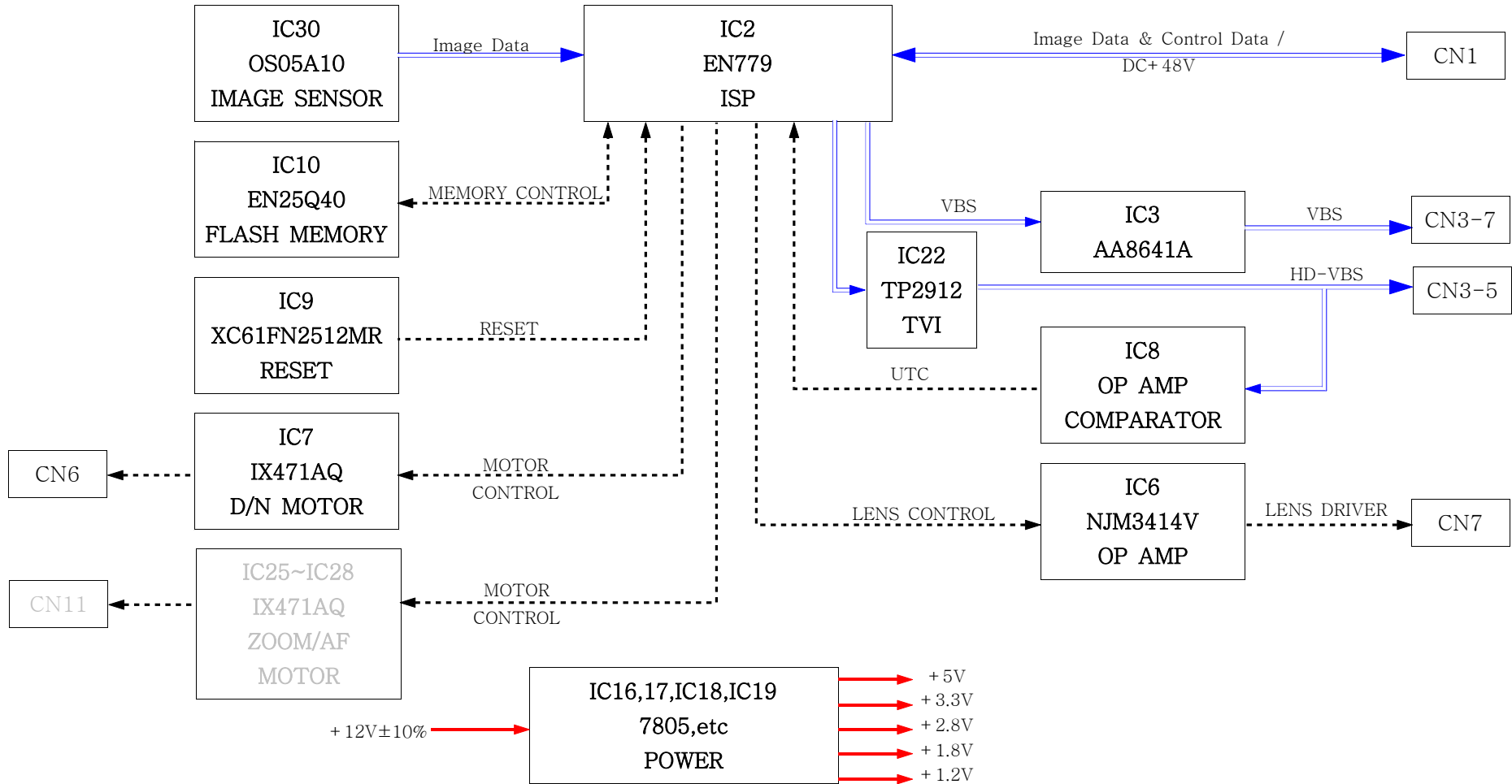
## 2. Applications & Information

### 2-1. General Specifications & Functions

Items	Sub-items	HCM-F872TNL
CMOS	Device	1/2.7" 5MEGA CMOS(OmniVision OS05A10)
	Total	2688 (H) × 1944 (V)
	Effective	
Performance	Horizontal/Vertical Resolution	2688/1944 Pixels
	Minimum illumination (F1.2, AGC Max)	Color : 0.2 Lux(50IRE) / 0.05 Lux(15IRE) B/W : 0.05 Lux(50IRE) / 0.02 Lux(15IRE)
	S/N Ratio	More than 50dB(AGC off)
	Frame	30fps QHD
Functions	OSD	English/Chinese/Chinese(S)/Japanese/Korea
	Day&Night	Auto/Color/B&W/EXTERN
	ATW	1800 ~ 10500K
	High Speed Shutter	1/30(1/25) ~ 1/30Ksec
	WDR	Line mode(30fps)/ Frame mode(15fps) and ROI
	D-WDR	Off/ON
	BLC	Off/ON (Size, Position)
	HLC	Level Setting(0~20), Color
	AGC	Level Setting(0~10) : Max 72dB(TBD)
	Camera Title	Off/On (Letters A~Z, Numerals 0~9, Symbols)
	White Balance	AUTO / AUTOext / PUSH / MANUAL
	DNR	2D+3DNR, OFF/LOW/MIDDLE/HIGH
	Motion Detection	Off/ON
	Privacy Mask	BOX(16 Areas), Polygon(8 Areas) (On/Off, Color, Position)
	Sens-Up	x2,x4,x8,x16,x32
De-Fog	AUTO/Manual	
Etc. Function	Sharpness, Reverse(H,V)	0~10, Mirror, Flip
	Color Bar	Off/ON
	In/Output	Alarm Output, Ext IR Mode, IR LED Off/On
	UTC	Pelco-D
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)
Digital Serial Video Output	Selectable HD-SDI or EX-SDI1.0/2.0/2.1(Long Reach)	
Lens	Iris	DC iris(Galvanometer)
	TDN	Day & Night(Galvanometer)
	Lens	2.8~12mm 2-MOTOR(AF)
Power Consumption		DC 12V±10%, Less than 3.2 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

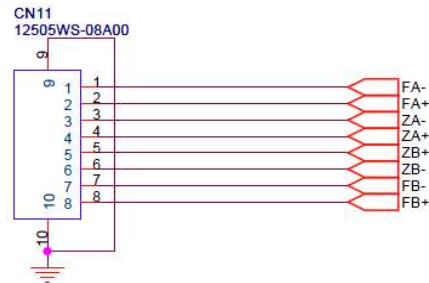
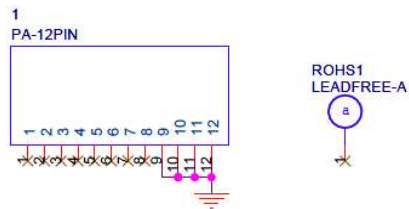
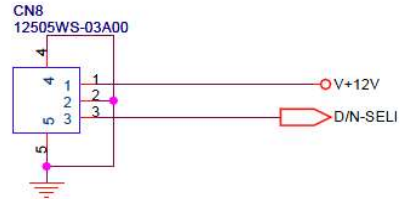
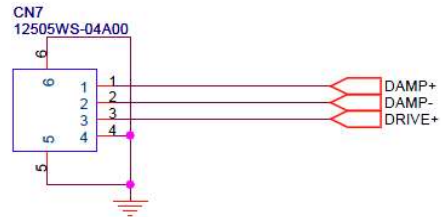
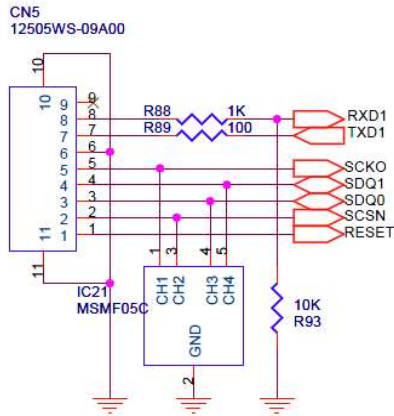
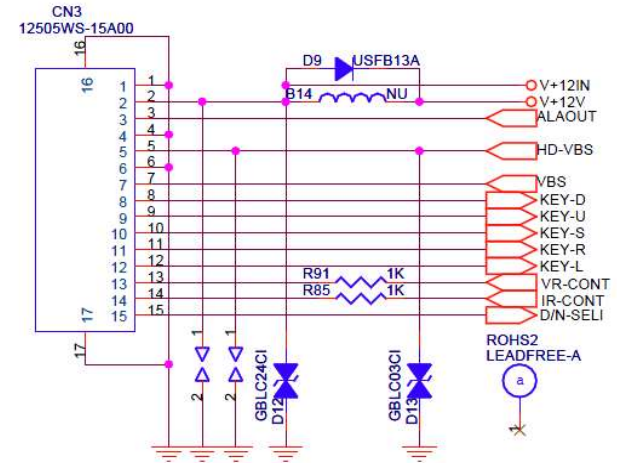
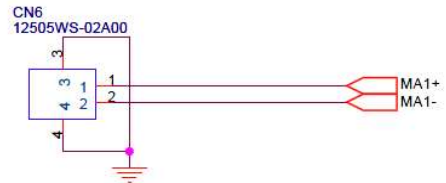
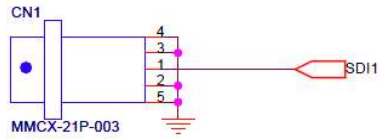






## 2-3. I/O Interface Specifications

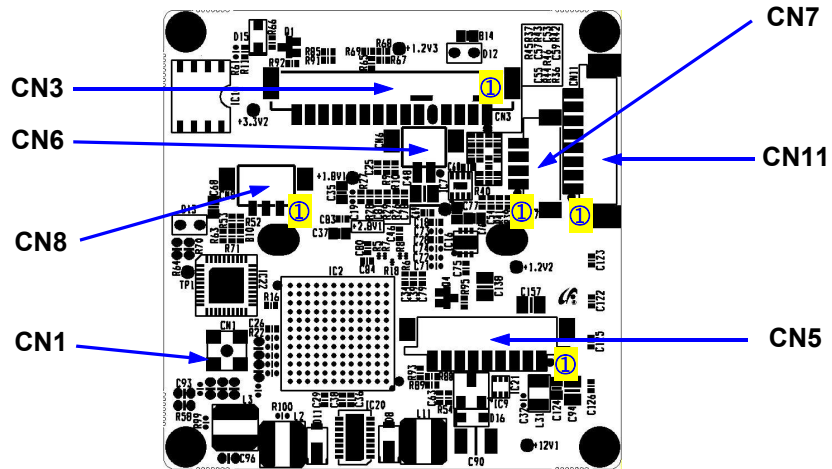
### 2-3-1. I/O Circuit





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

Bottom View



① CN3 : 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	4M 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	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 CN5 : Connector for upgrading Camera Program

Pin NO	Pin Name	Description	Normal	Active	I/O
1	RESET	System Reset	Open	3.3V/0V	I
2	SCSN	Flash Memory Chip Select	Open	3.3V/0V	I
3	SDQ0	Flash Memory Data0	Open	3.3V/0V	I
4	SDQ1	Flash Memory Data1	Open	3.3V/0V	I
5	SCKO	Flash Memory Clock	Open	3.3V/0V	I
6	GND	Board Ground	-	-	-
7	TXD1	UART Transmit OUTPUT1(RS232)	3.3V/0V	3.3V/0V	O
8	RXD1	UART Receive INPUT1(RS232)	0V	3.3V/0V	I
Yeonho Electronics, 12505WS-08A00					

③ CN6 : 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 CN7 : 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 CN1 : HD-SDI / EX-SDI1,2 Digital Serial Video Output Connector

Pin NO	Pin Name	Description	Normal	Active	I/O
1	SDI1	HD-SDI / EX-SDI Serial data output	-	0.8Vp_p	O
2	GND	Board GROUND	-	-	-
3	GND	Board GROUND	-	-	-
4	GND	Board GROUND	-	-	-
5	GND	Board GROUND	-	-	-
MMCX-210-003					

⑥ CN8 : 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					

⑨ CN11 : Focus/Zoom Motor Connector(Optional)



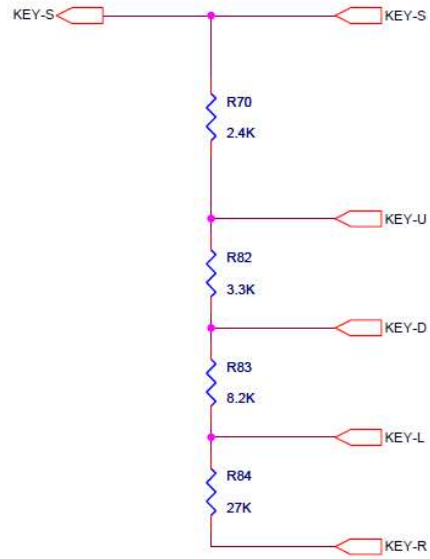
Pin NO	Pin Name	Description	Normal	Active	I/O
1	FA-	Focus A- Motor Drive Signal	Hi-Z	3.3V/0V	O
2	FA+	Focus A+ Motor Drive Signal	Hi-Z	3.3V/0V	O
3	ZA-	Zoom A- Motor Drive Signal	Hi-Z	3.3V/0V	O
4	ZA+	Zoom A+ Motor Drive Signal	Hi-Z	3.3V/0V	O
5	ZB+	Zoom B+ Motor Drive Signal	Hi-Z	3.3V/0V	O
6	ZB-	Zoom B- 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

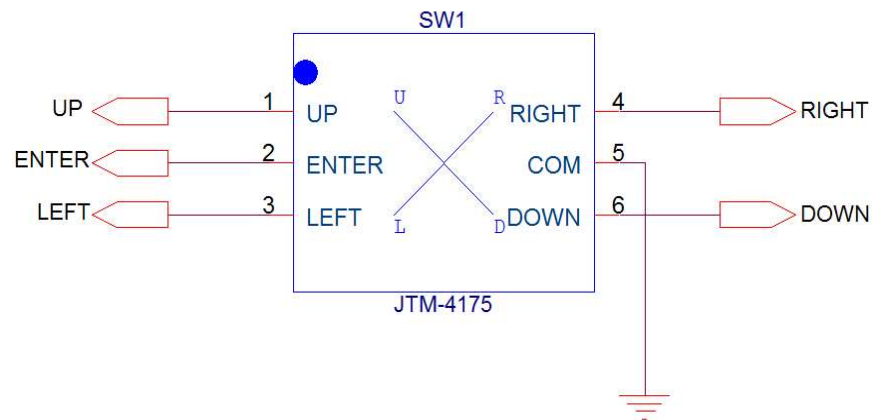
#### ① KEY-VOLTAGE

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. How to Choose a Video Output(OSD Key)

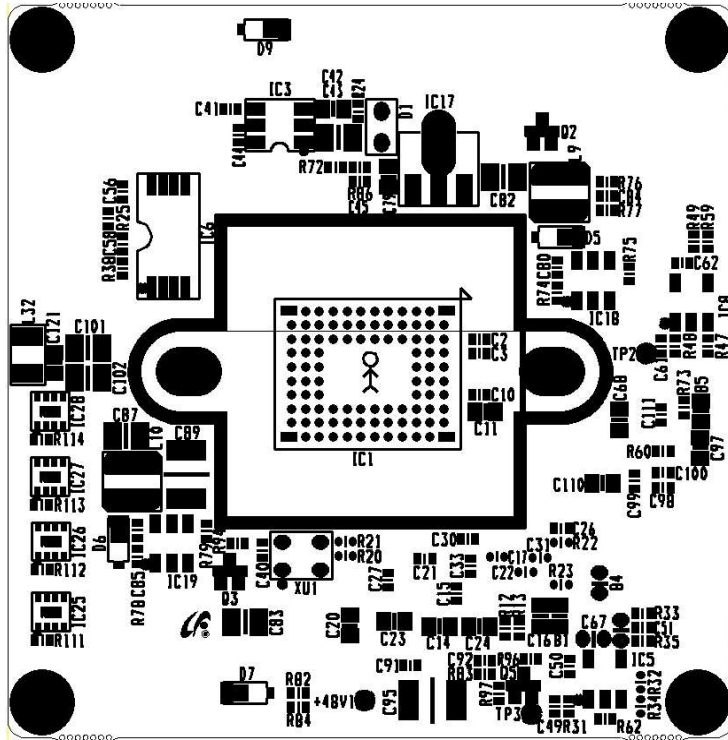
NO	Output Port	Output Format	OSD KEY				적용	Remarks
			1'st	2'nd	3'rd			
1	CN2-7	CVBS	DOWN	LEFT	ENTER	○	NTSC mega	
2	CN2-5	AHD	DOWN	RIGHT	ENTER	○	AHD 2.0	
3		TVI	DOWN	DOWN	ENTER	○	TVI	
5	CN7 MMCX	HD-SDI	UP	DOWN	ENTER	○	HD-SDI	
6		EX-SDI 1.0	UP	LEFT	ENTER	○	EX-SDI 1.0	
7		EX-SDI 2.0	UP	UP	ENTER	○	EX-SDI 2.0	
8		EX-SDI 2.1	UP	RIGHT	ENTER	○	EX-SDI 2.1	
9	2-MOTOR(AF)	TELE	UP(continuous)			○	2-MOTOR ZOOM MODULE only.	
10		WIDE	DOWN(continuous)			○		
11		FAR	RIGHT(continuous)			○		
12		NEAR	LEFT(continuous)			○		
13	Resolution	1440_30p	RIGHT	RIGHT	ENTER	○	1440_30p	
14		1080_30p	RIGHT	LEFT	ENTER	○	1080_30p	
15		1440_25p	RIGHT	UP	ENTER	○	1440_25p	
16		1080_25p	RIGHT	DOWN	ENTER	○	1080_25p	

MARK	CONNECTOR	VIDEO Output	HD-SDI	EX-SDI 1.0	EX-SDI 2.0	EX-SDI 2.1	TVI	AHD	VBS	Remarks
1	CN7 MMCX	SDI Output	○	○	○	○	X	X	X	
2	CN2-5	HD ANALOG Output	X	X	X	X	○	○	X	
3	CN2-7	Monitor Output(NTSC)	△	△	△	△	△	△	○	
○	Output performance function OK									
X	Output Disable									
△	Output OK, performance, function, image quality is not guaranteed. Simple MONITOR function (for adjusting angle of view and focus for installation)									
	when Resolution is 1440p, SDI transfer format is fixed to EX-SDI 1.0 in SDI output mode									

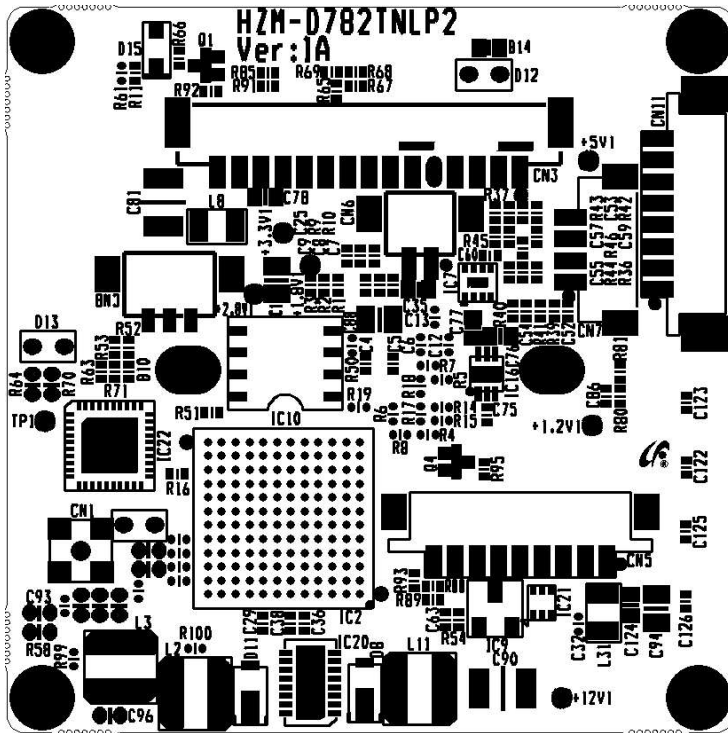


## 2-3-5. PCB Layout

<TOP VIEW>

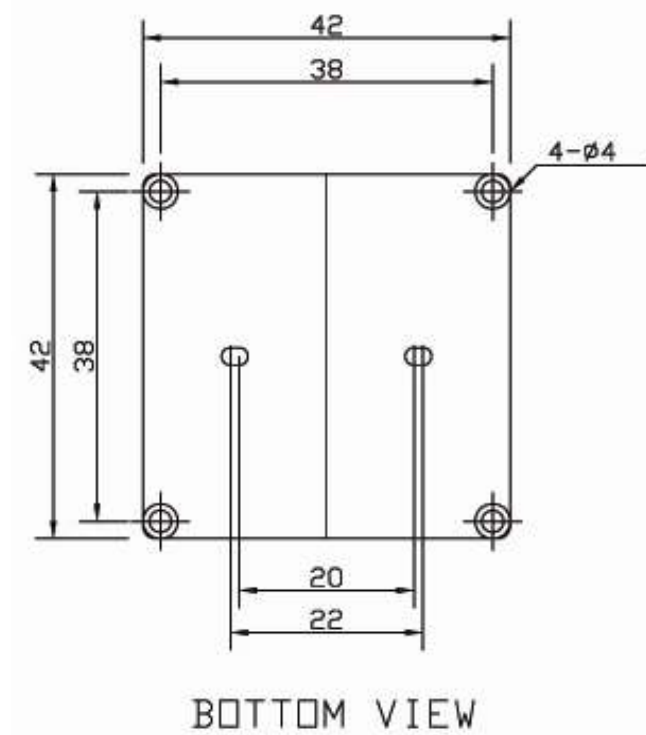
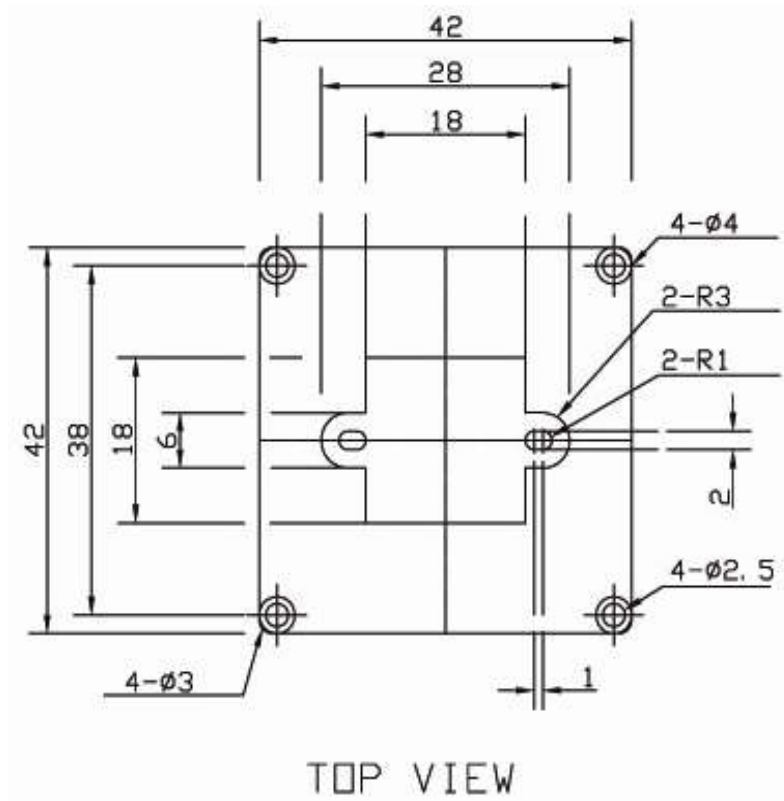


<BOTTOM VIEW>





## 2-4. PCB Outline Dimensions







## 2-5. OSD Menu tree

Main Menu	Sub Menu	Descriptions
LENS	MODE	DC,MANUAL
2-MOTOR	AF MODE	AUTO,MANUAL,HOLD
	SCANNING	HALF,FULL
	ONE PUSH AF	ON
	SYNC TDN	OFF,ON
	INITIAL	ON
	WIDE/TELE	TELE, WIDE
EXPOSURE	BRIGHTNESS	0~20
	SHUTTER	AUTO,MANUAL,FLICKER
	SENS-UP	OFF,X2~X32
	AGC	0~10
BACKLIGHT	MODE	OFF,HLC,BLC,WDR
	HLC	LEVEL:0~20, COLOR: BLK,WHT,YEL,GYN,GRN,MAG,RED,BLU
	BLC	H-POS,V-POS,H-SIZE,V-SIZE
	WDR	LINE/FRAME MODE, ROI ON, WEIGHT
DAY/NIGHT	MODE	AUTO,COLOR,B&W,EXTERN
	AUTO	AGC THRES, AGC MARGIN, DELAY,SMART IR
	COLOR	-
	B&W	SMART IR
	EXTERN	EXTERN SW, D>N THRES, N>D THRES, DELAY, SMART IR
WHITE BAL	MODE	AUTO,AUTOext,PRESET,MANUAL
	COLOR GAIN	0~20
	AUTO	-
	AUTOext	-
	PRESET	PRESET, PUSHING
	MANUAL	C-TEMP,R-GAIN,B-GAIN
DNR	MODE	OFF,LOW,MIDDLE,HIGH
IMAGE	SHARPNESS	0~10
	GAMMA	0.45,0.55,0.65,0.75



Main Menu	Sub Menu	Descriptions
IMAGE	MIRROR	OFF,ON
	FLIP	OFF,ON
	D-ZOOM	1.0X ~ 16.0X
	ACE	OFF,LOW,MIDDLE,HIGH
	DEFOG	OFF,ON
	SHADING	OFF,ON
	PRIVACY	OFF,ON
MOTION	WINDOW USE	0~3
	WINDOW_ZONE	OFF,ON
	DET H-POS	0~80
	DET V-POS	0~45
	DET H-SIZE	0~80
	DET V-SIZE	0~45
	SENSITIVITY	0~10
	MOTION OSD	OFF,ON
	TEXT ALARM	OFF,ON
	SIGNAL OUT	OFF,ON
SYSTEM	OUT INFO	HDSDI, EXSDI1.0, EXSDI2.0, EXSDI2.1, TVI, HD-A
	FRAME RATE	1440_30P(25P), 1080_30P(25P)
	FREQ	50HZ,60HZ
	SDI MODE	HDSDI, EXSDI1.0, EXSDI2.0, EXSDI2.1
	IMAGE RANGE	Full,Comp,User
	COLOR SPACE	HD-CbCr, YUV, SD-CbCr
	COLOR BAR	OFF,ON
	LANGUAGE	English,Chinese,Chinese(S) Japanese,Korea
	CAM TITLE	OFF,RIGHT UP, LEFT DOWN
	VERSION	D82X79 1A
EXIT	EXIT	SAVE, Reset



## 2-6 OSD Menu Functions

### ◆ Main Menu



#### ■ LENS

Select the Lens operation type.

#### ■ 2-MOTOR

Select the Auto Focus Item for 2-Motor

#### ■ EXPOSURE

Adjust camera exposure.

#### ■ BACKLIGHT

The function is used to set the Back Light Compensation(BLC) and High Light Compensation(HLC) and Wide Dynamic Range(WDR).

#### ■ DAY&NIGHT

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

#### ■ WHITE BAL

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

#### ■ DNR

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

#### ■ IMAGE

The function is used to adjust the camera picture(Sharpness, Gamma,Color Gain, etc).

#### ■ MOTION

The function is used to configure the Motion Detection operation and Alarm function which sense the movement of the scene.

#### ■ SYSTEM

Set up CVBS on/off, Language, etc.

#### ■ EXIT

SAVE: The function is used to save the various settings of the internal OSD menu.

RESET: The function initializes all the internal OSD menu settings.

#### KEY FUNCTIONS

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



## ◆ LENS

DC: IRIS Control, MANUAL: SHUTTER Control

FUNCTION	OPTION	DESCRIPTION
LENS	DC MANUAL	DC (Automatic IRIS Control) MANUAL (Electronic Shutter Control)

## ◆ 2-MOTOR



FUNCTION	OPTION	DESCRIPTION
AF MODE	AUTO MANUAL HOLD	Executes the Auto Focus after Zoom in/out Focus the subjects manually Keep the current focus state without moving the lens
SCANNING	HALF FULL	Scan the half focus boundary Scan the full focus area
ONE PUSH AF	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
WIDE/TELE	<>	Move the zoom position using the DVR left/right command when DVR zoom-move command is not supported

## ◆ EXPOSURE

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

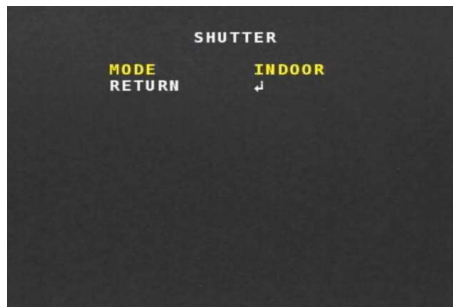
Use the "▲" "▼" "◀" "▶" "⊕" switch to select a menu item.





FUNCTION	OPTION	DESCRIPTION
BRIGHTNESS	0~20	Sets the screen brightness
SHUTTER	AUTO "Ⓜ"	Execute the Shutter speed automatically
	MANUAL "Ⓜ"	Execute the user setting Shutter speed
	FLICKER	Execute the Flickerless Shutter speed.
SENS-UP	OFF,X2,X4,X8,X16,X32	Adjusts the SENS-UP
AGC	0~10	Adjusts the AGC

### ■ SHUTTER (AUTO)



FUNCTION	OPTION	DESCRIPTION
MODE (DC)	INDOOR	IRIS
	OUTDOOR	IRIS+SHUTTER
	DEBLUR	SHUTTER:1/250+AGC
(MANUAL)	NORMAL	SHUTTER
	DEBLUR	SHUTTER:1/250+AGC

### ■ SHUTTER(MANUAL)



FUNCTION	OPTION	DESCRIPTION
SPEED	<60HZ(50HZ)> 1/30(25),1/60(50), 1/120(100),1/250, 1/700,1/1000, 1/1600,1/2500,	Sets the screen shutter



	1/5000,1/7000, 1/10000,1/30000	
--	-----------------------------------	--

## ◆ BACKLIGHT

\*WDR does not operate while CVBS is being output.

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
BACKLIGHT	OFF HLC"Ⓢ" BLC"Ⓢ" WDR"Ⓢ"	– HLC(High Light Compensation) ON BLC(Back light Compensation) ON. WDR(Wide Dynamic Range) ON.

### ■ HLC



FUNCTION	OPTION	DESCRIPTION
LEVEL	0~20	Adjusts the HLC Mask Level
COLOR	BLK,WHT,YEL,CYN, GRN,MAG,RED,BLU	Select the HLC Mask color

### ■ BLC



FUNCTION	OPTION	DESCRIPTION
H-POS	0~26	Can be adjusted BLC area
V-POS	0~26	
H-SIZE	0~26	
V-SIZE	0~20	



## ■ WDR



FUNCTION	OPTION	DESCRIPTION
WDR MODE	LINE, FRAME	WDR 30Frame(Less image retention than frame mode) WDR 15Frame(typical wdr operation)
ROI MODE	OFF,ON	the selected area is compensated by ROI algorithm
WEIGHT	LOW,MIDDLE,HIGH	Selects the WDR weight

## ■ ROI



FUNCTION	OPTION	DESCRIPTION
WINDOW ZONE	0~3	Selects the window zone number
WINDOW USE	OFF,ON	Sets the selected zone ROI on,off
H-POS	0~2560	Sets the selected zone horizontal start position
V-POS	0~1440	Sets the selected zone vertical start position
H-SIZE	0~2560	Sets the selected zone horizontal size
V-SIZE	0~1440	Sets the selected zone vertical size

## ◆ DAY&NIGHT

FUNCTION	OPTION	DESCRIPTION
DAY/NIGHT	AUTO"☉" COLOR	switches between day and night mode automatically based upon the level of illumination on the scene fixed day fixed night



	B&W EXTERN"Ⓢ"	changes between day and night operation upon triggering from an external source
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## ■ AUTO



FUNCTION	OPTION	DESCRIPTION
AGC THRESHOLD	0~20	Sets the threshold for identifying the Night status from the Day status.
AGC MARGIN	0~20	Sets the margin for identifying the Night status from the Day status.
DELAY	0~20	Sets the Night/Day identification transfer time.
Smart IR	0~20	Brightness of IR and saturation phenomenon are automatically adjusted.

## ■ EXTERN

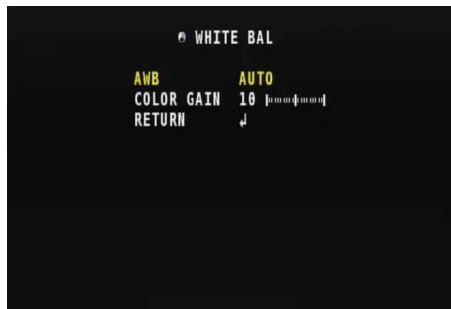


FUNCTION	OPTION	DESCRIPTION
EXTERN SW	LOW,HIGH	Selects the active level.
D>N THRES	0~20	Sets the b&w operation level when external sense is used
N>D THRES	0~20	Sets the color operation level when external sense is used
DELAY	0~20	Sets the Night/Day identification transfer time.
Smart IR	0~20	Brightness of IR and saturation phenomenon are automatically adjusted.





## ◆ WHITE BALANCE



FUNCTION	OPTION	DESCRIPTION
AWB	AUTO AUTOext PUSH	Auto trace white balance. TDN lens Auto trace white balance. Can be changed in AWC mode only. When the set color temperature doesn't meet with user's environment, press the menu button long to adjust the color temperature to desired setting.
	MANUAL "Ⓢ"	Manual white balance.
COLOR GAIN	0~20	Adjusts COLOR GAIN

## ■ MANUAL



FUNCTION	OPTION	DESCRIPTION
C-TEMP	3000K, 5000K, 8000K	Selects Color Temperature
R-GAIN	0~20	Adjusts R-GAIN
B-GAIN	0~20	Adjusts B-GAIN



## ◆ DNR

FUNCTION	OPTION	DESCRIPTION
DNR	OFF, LOW, MIDDLE, HIGH	Set up 3D-DNR(Digital Noise Reduction) LEVEL.

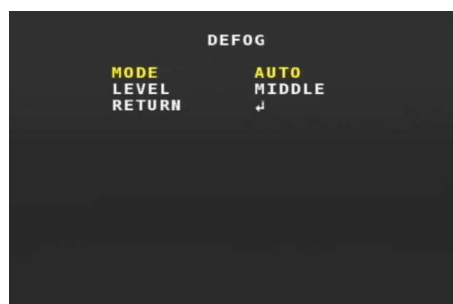
## ◆ IMAGE

### ■ IMAGE



FUNCTION	OPTION	DESCRIPTION
SHARPNESS	0~10	Select the resolution of the camera.
GAMMA	0.45,0.55,0.65,0.75	Select the GAMMA
MIRROR	OFF,ON	Set up the screen mirror
FLIP	OFF,ON	Set up the screen flip
D-ZOOM	1.0X ~ 16.0X	Sets the digital zoom magnification
ACE	OFF,LOW,MIDDLE. HIGH	Select Digital ACE(Advanced Enhance) level
DEFOG	OFF,ON"Ⓜ"	Defog on,off
SHADING	OFF,ON"Ⓜ"	Lens shading on,off
PRIVACY	"Ⓜ"	Sets the Privacy function

### ■ DEFOG





FUNCTION	OPTION	DESCRIPTION
MODE	AUTO, MANUAL	Changes the Defog level automatically Executes the Defog function within fixed Defog level
LEVEL	LOW,MIDDLE,HIGH	Selects the Defog function weight

## ■ SHADING



FUNCTION	OPTION	DESCRIPTION
WEIGHT	0 ~ 100%	Selects the lens shading weight

## ■ PRIVACY



FUNCTION	OPTION	DESCRIPTION
BOX	OFF,ON"Ⓢ"	Sets the privacy function as the box style
POLYGON	OFF,ON"Ⓢ"	Sets the privacy function as the polygon style

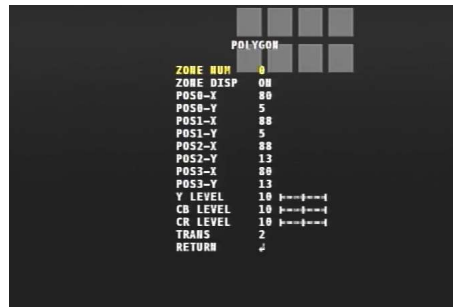


■ BOX



FUNCTION	OPTION	DESCRIPTION
ZONE NUM	0~15	Select the Privacy zone number
ZONE DISP	OFF,ON	Show up PRIVACY AREA function on the screen
H-POS V-POS H-SIZE V-SIZE	0~80 0~46 0~80 0~46	Can be adjusted Privacy area
Y LEVEL	0~20	Adjusts the Y LEVEL of the Privacy zone area
CB LEVEL	0~20	Adjusts the B GAIN of the Privacy zone area
CR LEVEL	0~20	Adjusts the R GAIN of the Privacy zone area
TRANS	0~3	Adjusts the transparency of the Privacy zone area

■ POLYGON



FUNCTION	OPTION	DESCRIPTION
ZONE NUM	0~5	Select the Privacy zone number
ZONE DISP	OFF,ON	Show up PRIVACY AREA function on the screen
POS0-X POS0-Y POS1-X POS1-Y POS2-X POS2-Y POS3-X POS3-Y	0~160 0~91 0~160 0~91 0~160 0~91 0~160 0~91	Can be adjusted Privacy area as the polygon style



Y LEVEL	0~20	Adjusts the Y LEVEL of the Privacy zone area
CB LEVEL	0~20	Adjusts the B GAIN of the Privacy zone area
CR LEVEL	0~20	Adjusts the R GAIN of the Privacy zone area
TRANS	0~3	Adjusts the transparency of the Privacy zone area

## ◆ MOTION



FUNCTION	OPTION	DESCRIPTION
DET WINDOW	"Ⓞ"	Adjust the size of the detection area
SENSITIVITY	0~20	Sets the motion detection sensitivity
MOTION OSD	OFF,ON	Display the motion detection position
TEXT ALARM	OFF,ON	Display the motion detection state
TEXT ALARM	OFF,ON	Display the motion detection state

## ■ DET WINDOW



FUNCTION	OPTION	DESCRIPTION
WINDOW USE	0~3	Select the Motion set number
WINDOW ZONE	OFF,ON	Active the Motion set number
DET H-POS	0~80	Adjust the size of the detection area
DET V-POS	0~45	
DET H-SIZE	0~80	
DET V-SIZE	0~45	



## ◆ SYSTEM



FUNCTION	OPTION	DESCRIPTION
OUTPUT.	"Ⓢ"	Sets the video format and transfer format
IMAGE RANGE	Full,Comp,User"Ⓢ"	Digital output data scale
COLOR SPACE	HD-CbCr, YUV, SD-CbCr	Sets the signal format
COLOR BAR	OFF,ON	Display Color bar pattern
LANGUAGE	English,Chinese,Chinese(S) Japanese,Korea	Selects the language in which to display the internal OSD menu
CAM TITLE	OFF,ON"Ⓢ"	Sets Camera TITLE
VERSION	D87X79 1A	Camera VERSION display

## ■ OUTPUT



FUNCTION	OPTION	DESCRIPTION
OUT INFO	HDSDI, EXSDI1.0, EXSDI2.0, EXSDI2.1, TVI, HD-A	Displays the current transfer format
FRAME RATE	1440_30P(25P),1080_30P(25P)	Sets the format and frame rate
FREQ	50HZ,60HZ	Sets the system frequency
SDI MODE	HDSDI, EXSDI1.0, EXSDI2.0, EXSDI2.1, NOT USED	Selects the SDI transfer format in SDI mode



## ■ IMAGE RANGE



FUNCTION	OPTION	DESCRIPTION
IMAGE RANGE	0~32	Digital output data scale

## ■ CAM TITLE

This function can set up Title, Version, Communication, etc  
 Use the "▲" "◀" "▶" "Ⓢ" switch to select a menu item



## ◆ Exit

FUNCTION	OPTION	DESCRIPTION
EXIT	SAVE	All the settings of the internal OSD menu are saved.
	RESET	All the internal OSD menu settings are reset.



## ◆ Menu default data change "▲" "▼" "◀" "▶" "ⓔ"

Sets the menu data to be used as default data.  
and then push the left button for 3 seconds at system item.



Push the enter button for 3 seconds at save item  
(appear the 'pushing' instead of 'on')  
and then exit the menu.







### 3. Packing Information

