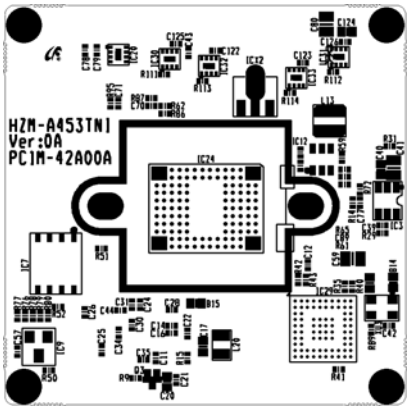
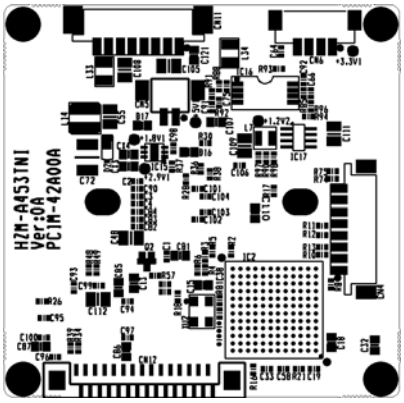
CUSTOMER	
ATTENTION 1	**2 Mega CMOS**
ATTENTION 2	**42x42mm**
MODEL	**PZM-A453TNI**
CODE NO	

Color Camera Module

SPECIFICATIONS

JAN.31 2020





P&A Corporation

Table of Contents

- Revision History

Date	Version	Description
JAN.31 2020	0A	Establishment

1. Features

■ 1/3" IMX291LQR 2MEGA SONY STAVIS™ CMOS

High definition 12-bit digital image signals offering 2 mega pixels
are obtained with high speed of 30 fps and with low power consumption.

■ High Resolution 1100(Color)/(BW) TV Lines

This camera has realized high resolution of **1100(Color)/(BW)** TV lines 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.
EXT1/2 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

Brightness of IR and saturation phenomenon are automatically adjusted.

■ OSD (On Screen Display)

This camera supports the OSD function which is used with multi language. And so, the camera can be controlled bye selecting text displayed on the monitor screen.

■ Privacy Mask Function (18 points)

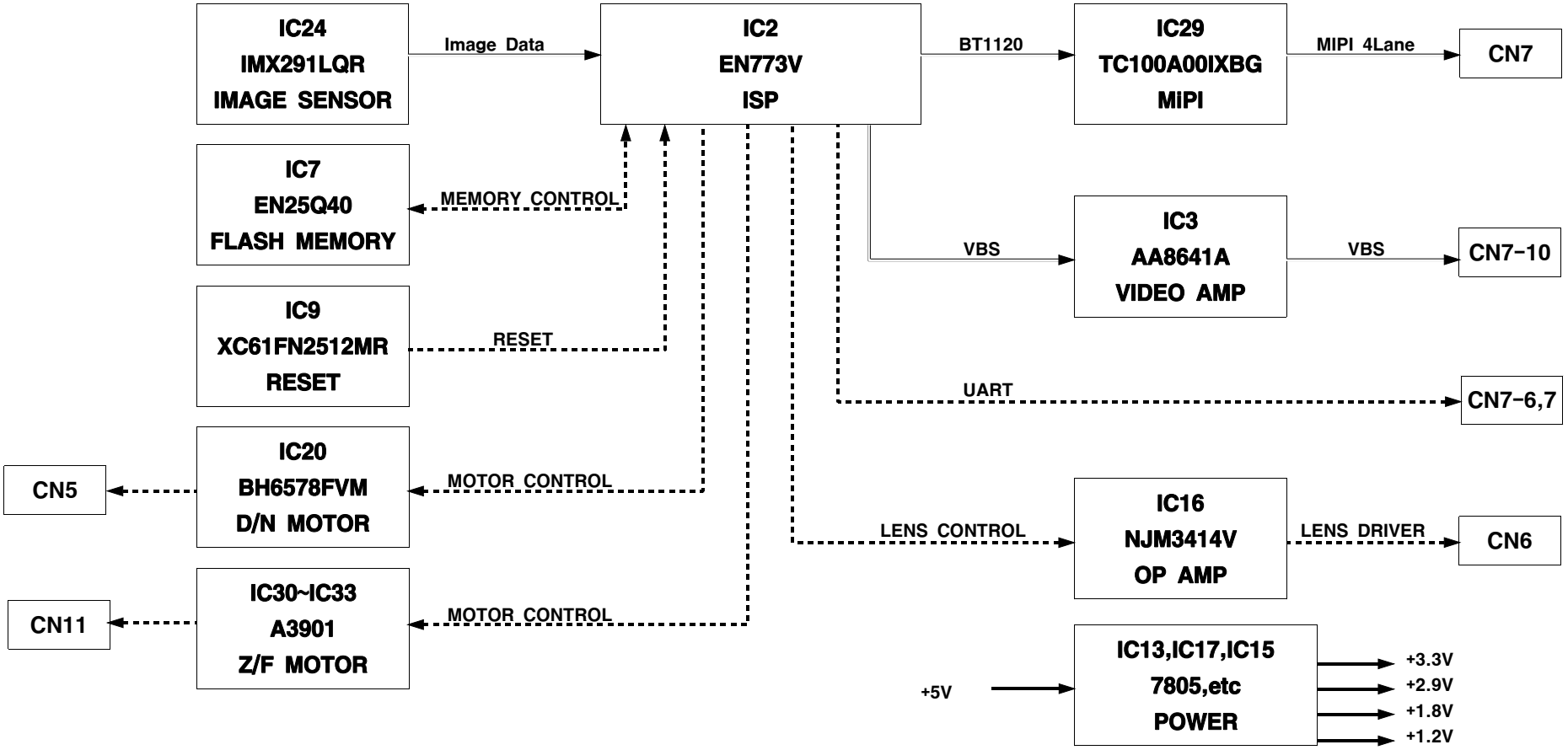
Privacy masking allows for the 'blanking' of specific areas of a scene, where the viewing or recording of images is prohibited or undesired.
The technology of this camera allows for the user defined setting of a four point polygonal mask, which is overlaid onto the video signal output.

2. Applications & Information

2-1. General Specifications & Functions

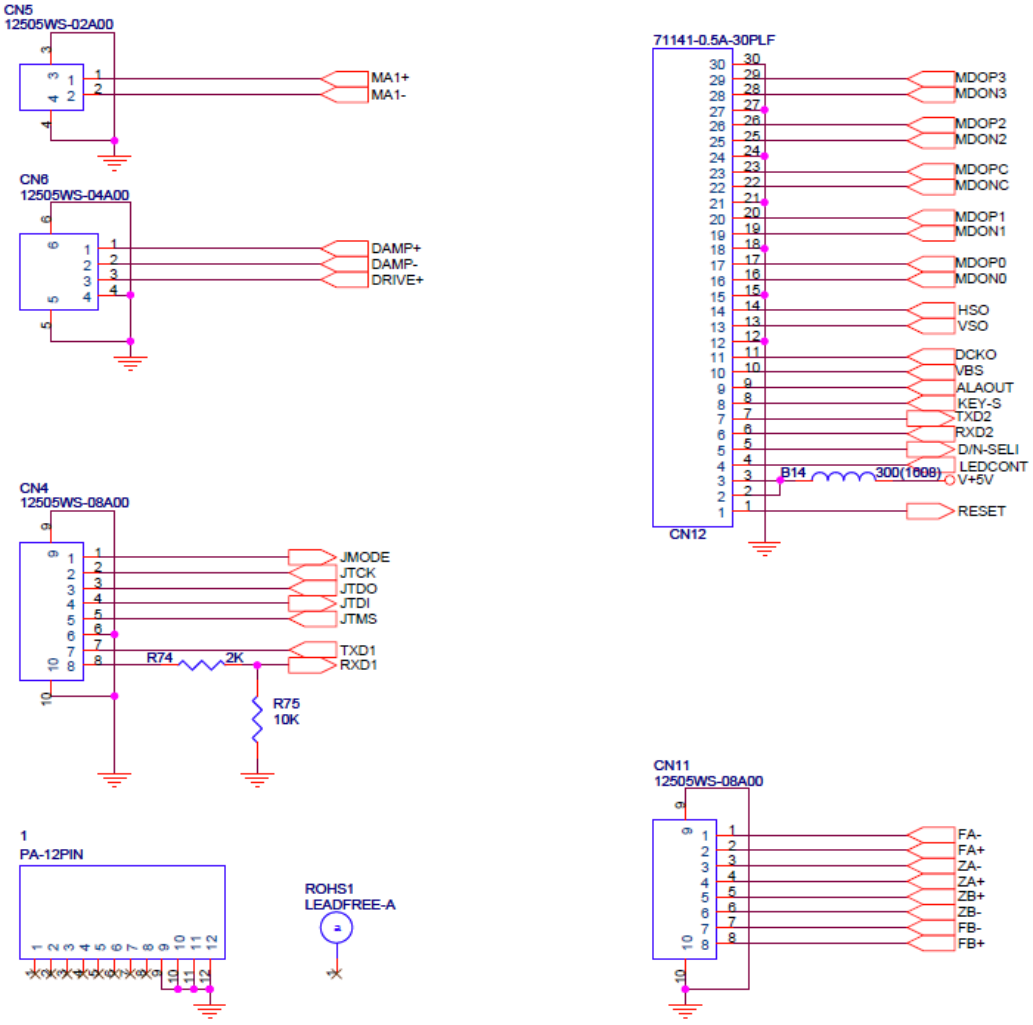
Items	Sub-items	PZM-A453TNI
CMOS	Device	1/3 2MEGA CMOS(IMX291LQR)
	Total	2000(H) × 1241(V)
	Effective	1984(H) x 1097 (V)
Performance	Horizontal Resolution	1100 TV Lines
	Minimum illumination(F1.2)	Color : 0.1 Lux(50IRE) / 0.02 Lux(15IRE) B/W : 0.08 Lux(50IRE) / 0.002 Lux(15IRE)
	S/N Ratio	More than 50dB (AGC off)
	Frame	30fps Full HD
Functions	OSD	English/Japanese/German/Italian/Francais/Spanish/Chinese/Portuguese/Korea
	Day&Night	Auto/Day/B&W/EXT1/EXT2
	ATW	1800 ~ 10500K
	High Speed Shutter	1/30(1/25) ~ 1/30Ksec
	WDR	Off/ON
	D-WDR	Off/ON
	BLC	Off/ON (Size, Position)
	HLC	Level Setting(0~20), Color
	AGC	Level Setting(0~10)
	D-Zoom	1.0x~8.0x
	Camera ID	Off/On (Letters A to Z, Numerals 0 to 9, Symbols)
	White Balance	AUTO / AUTOext / PUSH / MANUAL
	DNR	2D+3DNR, OFF/LOW/MIDDLE/HIGH
	Motion Detection	Off/ON
	Privacy Mask	16 Areas (On/Off, Color, Position)
	Sens-Up	x2 ~ 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
	Remote Control	UART(Pelco-D)
	2 Motor Control	Zoom, Focus(Auto Focus)
Output	Video Output	MIPI 4Lane(30pin FFC Max 100mm)
	Lens Iris	4pin
	TDN	2pin
	Auto Focus & Zoom	8pin
Power Consumption		DC 5V±10%, Less than 2.2 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



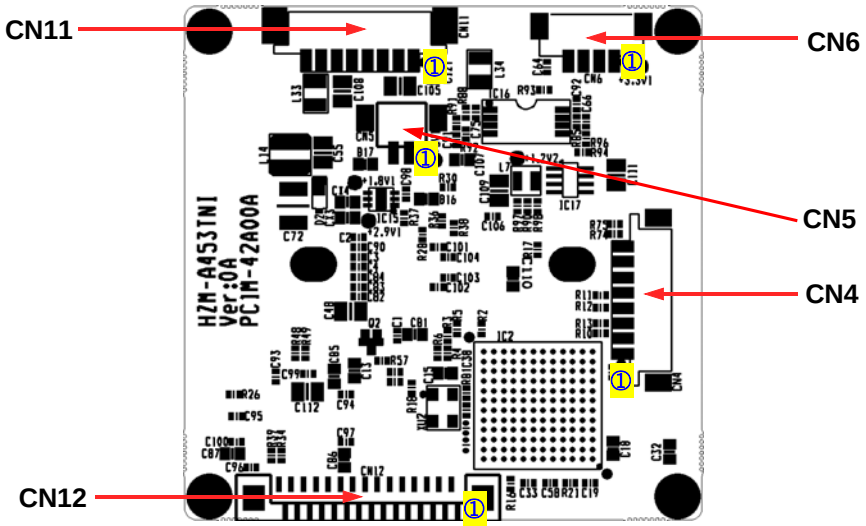
2-3. I/O Interface Specifications

2-3-1. I/O Circuit



2-3-2. I/O Specifications

Bottm View



① CN4 : Connector for upgrading Camera Program

Pin NO	Pin Name	Description	Normal	Active	I/O
1	JMODE	JTAG MODE(0:Program Debug, 1:Nomal)	Open	3.3V/0V	I
2	JTCK	JTAG CLOCK	Open	3.3V/0V	I
3	JTDO	JTAG DATA OUT	Open	3.3V/0V	I
4	JTDI	JTAG DATA IN	Open	3.3V/0V	I
5	JTMS	JTAG ENABLE	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 CN5 : 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 CN6 : 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				

⑧ CN12 : Signal I/O

Pin NO	Pin Name	Description	Normal	Active	I/O
30	GND	Ground	-	-	-
29	MDOP3	MIPI digital Output Image Data3+		0/1V	O
28	MDON3	MIPI digital Output Image Data3-		0/1V	O
27	GND	Ground	-	-	-
26	MDOP2	MIPI digital Output Image Data2+		0/1V	O
25	MDON2	MIPI digital Output Image Data2-		0/1V	O
24	GND	Ground	-	-	-
23	MDOPC	MIPI digital Output Image Clock+		0/1V	O
22	MDONC	MIPI digital Output Image Clock-		0/1V	O
21	GND	Ground	-	-	-
20	MDOP1	MIPI digital Output Image Data1+		0/1V	O
19	MDON1	MIPI digital Output Image Data1-		0/1V	O
18	GND	Ground	-	-	-
17	MDOP0	MIPI digital Output Image Data0+		0/1V	O
16	MDON0	MIPI digital Output Image Data0-		0/1V	O
15	GND	Ground	-	-	-
14	HSO	Horizontal sync Output		0/3.3V	O
13	VSO	Vertical sync Output		0/3.3V	O
12	GND	Ground	-	-	-
11	DCKO	Output Pixel Clock		0/3.3V	O
10	VBS	Composite Video Output(SUB1)	-	1Vp-p	O
9	ALAOUT				
8	KEY-S	OSD Control A/D Key Input	3.3V	ADC/0V	I
7	TXD	UART TXD		0/3.3V	I/O
6	RXD	UART RXD		0/3.3V	I/O
5	D/N-SELI	Board GROUND	-	-	-
4	LEDCONT	Board GROUND	-	-	-
3	V+5V	DC +5V Input	-	+5V	P
2	V+5V	DC +5V Input	-	+5V	P
1	RESET	Main Reset	3.3V	0V	I/O
GANA ELECTRONIC 71141-0.5A-30PLF					

⑨ CN11 : 2-Motor Connector

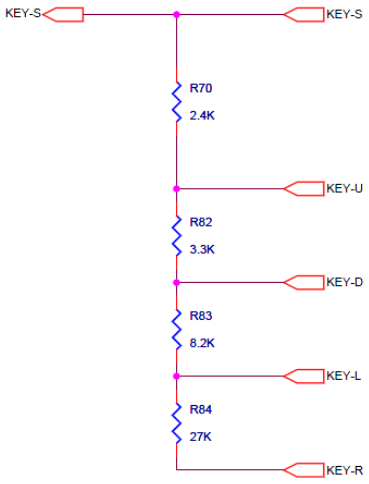
Pin NO	Pin Name	Description	Normal	Active	I/O
1	FA-	Focus A- Motor Drive Signal		3.3V/0V	O
2	FA+	Focus A+ Motor Drive Signal		3.3V/0V	O
3	ZA-	Zoom A- Motor Drive Signal		3.3V/0V	O
4	ZA+	Zoom A+ Motor Drive Signal		3.3V/0V	O
5	ZB+	Zoom B+ Motor Drive Signal		3.3V/0V	O
6	ZB-	Zoom B- Motor Drive Signal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

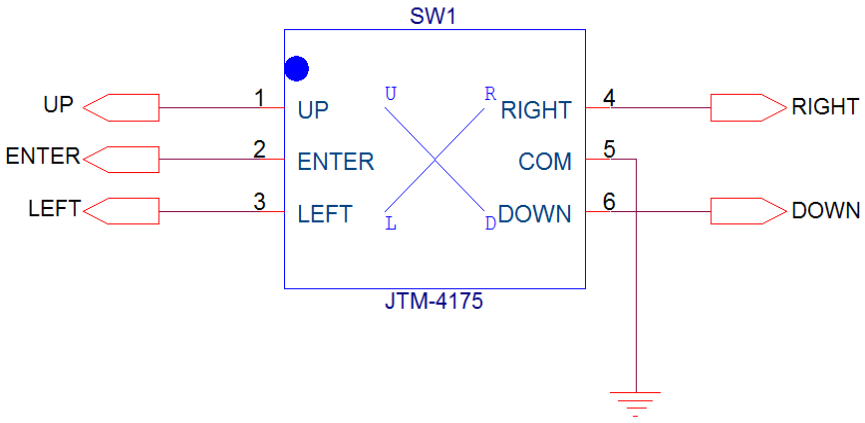
① KEY-VOLTAGE

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

② Internal/External Circuit

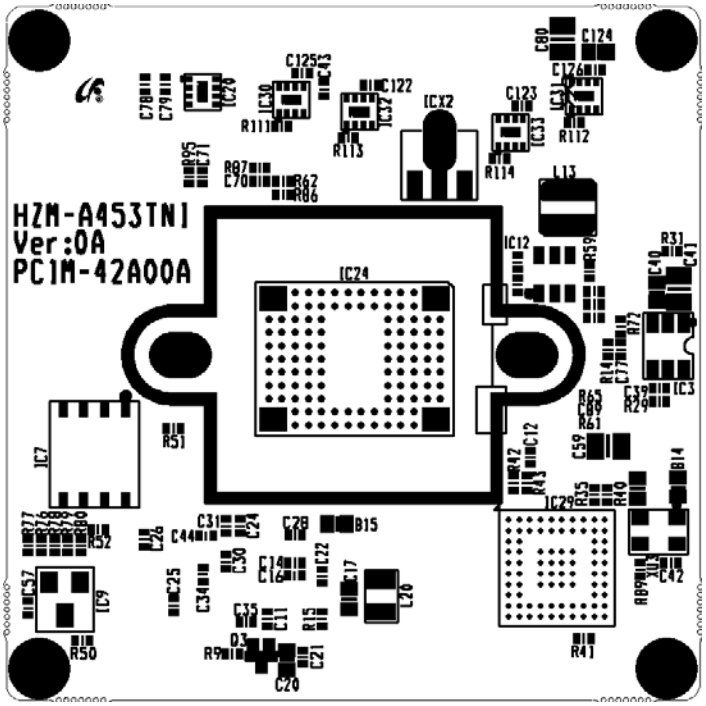


③ External Switch(Sample)



2-3-4. PCB Layout

<TOP VIEW>



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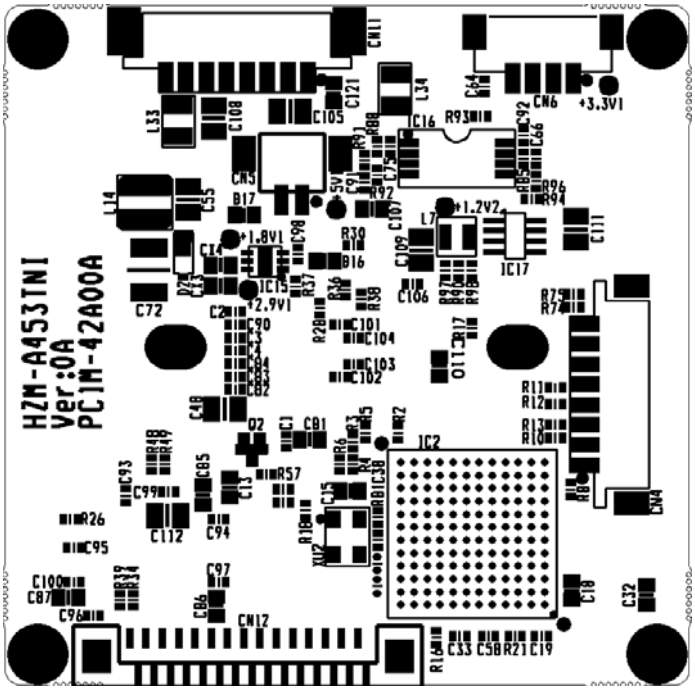
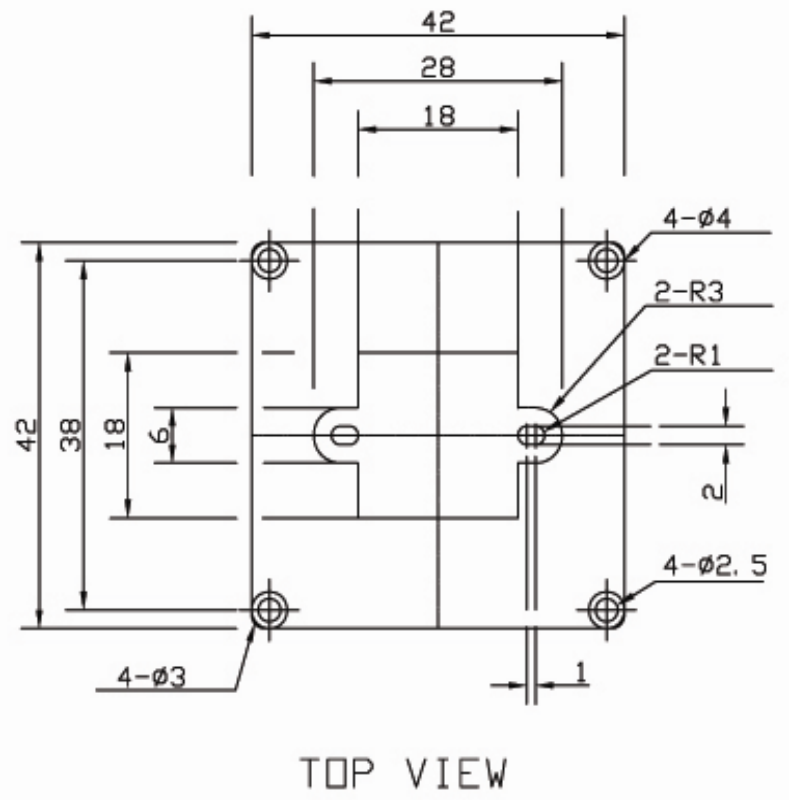
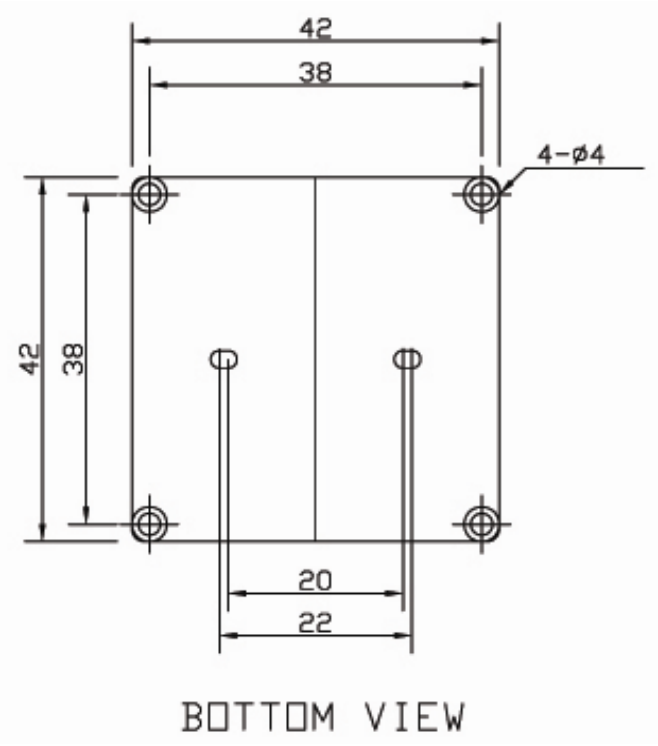


2-4. PCB Outline Dimensions





2-5. OSD Menu tree

Main Menu	Sub Menu	Descriptions
LENS	MODE	DC,MANUAL
EXPOSURE	BRIGHTNESS	0~20
	SHUTTER	AUTO,MANUAL,FLICKER
	TCS	OFF/MODE1~20
	SENS-UP	OFF,X2~X32
	AGC	0~20
	RETURN	
BACKLIGHT	MODE	OFF,HLC,BLC,WDR
	HLC	LEVEL:0~20, MODE: ALLDAY/NIGHT ONLY
	BLC	H-POS,V-POS,H-SIZE,V-SIZE
	WDR	WEIGHT: LOW,MIDDLE,HIGH
	RETURN	
DAY/NIGHT	MODE	AUTO,COLOR,B&W,EXTERN
	AUTO	THRESHOLD, MARGIN, DELAY,SMART IR
	COLOR	-
	B&W	SMART IR
	EXTERN	EXTERN SW, DELAY, SMART IR
	RETURN	
WHITE BAL	MODE	AUTO,AUTOext,PRESET,MANUAL
	AUTO	-
	AUTOext	-
	PRESET	PRESET, PUSHING
	MANUAL	KELVIN,R-GAIN,B-GAIN
	RETURN	
DNR	MODE	OFF,LOW,MIDDLE,HIGH
IMAGE	SHARPNESS	0~10
	GAMMA	0.45,0.5,0.55,0.6,0.65
	COLOR GAIN	0~20

Main Menu	Sub Menu	Descriptions
IMAGE	MIRROR	OFF,ON
	FLIP	OFF,ON
	D-ZOOM	1.0X~8.0X
	ACE	OFF,LOW,MIDDLE,HIGH
	DEFOG	OFF,ON
	SHADING	OFF,ON
	PRIVACY	OFF,ON
	RETURN	
MOTION	SENSITIVITY	0~20
	WINDOW TONE	0~6
	WINDOW USE	0~3
	WINDOW ZONE	OFF,ON
	DET H-POS	0~60
	DET V-POS	0~40
	DET H-SIZE	0~60
	DET V-SIZE	0~40
	RETURN	
OPTION	COM.	CAM ID, BAUDRATE, SAVE
	IMAGE RANGE	Full,Comp,User
	OUTPUT MODE	1080P,720P,720_CROP
	FRAME RATE	30FPS,25FPS
	COLOR BAR	OFF,ON
	CVBS	NTSC,PAL
	CVBS	OFF,ON
	LANGUAGE	English,Chinese,Chinese(S) Japanese,Korea
	TITLE	OFF,ON
	VERSION	477XE A5B
	RETURN	
EXIT	EXIT	SAVE, Reset

2-6 OSD Menu Functions

◆ Main Menu

■ **LENS**

Select the Lens operation type.

■ **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.

■ **OPTION**

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)

◆ 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"ⓔ" MANUAL"ⓔ" FLICKER	Execute the Shutter speed automatically Execute the user setting Shutter speed Execute the Flickerless Shutter speed.
TCS	OFF, MODE1~MODE20"ⓔ"	Selects the TCS MODE
SENS-UP	OFF,X2,X4,X8,X16,X32	Adjusts the SENS-UP
AGC	0~20	Adjusts the AGC

■ **SHUTTER (AUTO)** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
MODE (DC)	INDOOR OUTDOOR DEBLUR	IRIS IRIS+SHUTTER SHUTTER:1/240+AGC
(MANUAL)	NORMAL DEBLUR	SHUTTER SHUTTER:1/240+AGC

■ **SHUTTER(MANUAL)** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
SPEED	<60HZ(50HZ> 1/30(25),1/60(50), 1/120(100),1/250, 1/700,1/1000, 1/1600,1/7000, 1/5000,1/7000, 1/10000,1/30000	Sets the screen shutter

■ **TCS INFO** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
TCS	OFF	NOT USED
	MODE1	Shutter 1/120 + DN EXT + Smart IR 14
	MODE2	Shutter 1/250 + DN EXT + Smart IR 14
	MODE3	Shutter 1/700 + DN EXT + Smart IR 14
	MODE4	Shutter 1/1000 + DN EXT + Smart IR 14
	MODE5	Shutter 1/1600 + DN EXT + Smart IR 14
	MODE6	Shutter 1/120 + User DN + User Smart IR
	MODE7	Shutter 1/250 + User DN + User Smart IR
	MODE8	Shutter 1/700 + User DN + User Smart IR
	MODE9	Shutter 1/1000 + User DN + User Smart IR
	MODE10	Shutter 1/1600 + User DN + User Smart IR
	MODE11	Shutter 1/120 + DN EXT + Smart IR 14 + HLC
	MODE12	Shutter 1/250 + DN EXT + Smart IR 14 + HLC
	MODE13	Shutter 1/700 + DN EXT + Smart IR 14 + HLC
	MODE14	Shutter 1/1000 + DN EXT + Smart IR 14 + HLC
	MODE15	Shutter 1/1600 + DN EXT + Smart IR 14 + HLC
	MODE16	Shutter 1/120 + User DN + User Smart IR+ HLC
	MODE17	Shutter 1/250 + User DN + User Smart IR+ HLC
	MODE18	Shutter 1/700 + User DN + User Smart IR+ HLC
	MODE19	Shutter 1/1000 + User DN + User Smart IR+ HLC
	MODE20	Shutter 1/1600 + User DN + User Smart IR+ HLC
SPEED	1/120 ~ 1/1600	Show the Shutter speed value
DAY/NIGHT	AUTO~EXTERN	Show the DAY/NIGHT mode
SMART IR	0~20	Show the SMART IR level value
HLC	OFF,ON	Show the HLC on,off state

◆ BACKLIGHT

*Not CVBS output when WDR mode.

"◀" "▶"

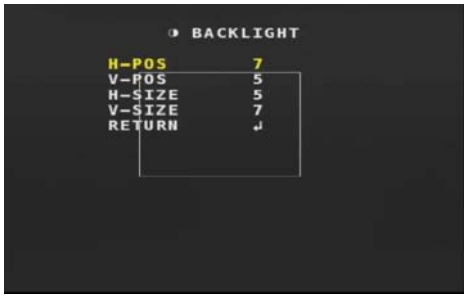
FUNCTION	OPTION	DESCRIPTION
BACKLIGHT	OFF HLC"ⓔ" BLC"ⓔ" WDR"ⓔ"	- HLC(High Light Compensation) ON BLC(Back light Compensation) ON. WDR(Wide Dynamic Range) ON.

■ **HLC** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
LEVEL	0~20	Adjusts the HLC Mask Level
MODE	ALL DAY, NIGHT ONLY	Select the HLC Mask excution condition

■ **BLC** "▲" "▼""◀" "▶" "ⓔ"



"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
H-POS V-POS H-SIZE V-SIZE	0~20 0~20 5~20 7~20	Can be adjusted BLC area

■ **WDR** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
WEIGHT	LOW,MIDDLE,HIGH	Selects the WDR weight

◆ DAY/NIGHT

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
DAY/NIGHT	AUTO"ⓔ"	switches between day and night mode automatically based upon the level of illumination on the scene
	COLOR	fixed day
	B&W"ⓔ"	fixed night
	EXTERN"ⓔ"	changes between day and night operation upon triggering from an external source

■ **AUTO** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
THRESHOLD	0~20	Sets the threshold for identifying the Night status from the Day status.
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.

■ **B&W** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
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.
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	Auto trace white balance.
	AUTOext	TDN lens Auto trace white balance.
	PUSH	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.

■ **MANUAL** "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
KELVIN	LOW,MIDDLE,HIGH	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
COLOR GAIN	0~20	Adjusts COLOR GAIN
MIRROR	OFF,ON	Set up the screen mirror
FLIP	OFF,ON	Set up the screen flip
D-ZOOM	1.0X~16.0X	Enlarge the screen with DIGITAL ZOOM
ACE	OFF,LOW,MIDDLE. HIGH	Select Digital ACE(Advanced Enhance) level
DEFOG	OFF,ON"ⓔ"	Defog on,off
SHADING	OFF,ON"ⓔ"	Sets the Lens Shading
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
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	0~60 0~40 0~40 0~40	Can be adjusted Privacy area
Y LEVEL	0~20	Adjusts the Y LEVEL of the Privacy zone area
CB LEVEL CR LEVEL	0~20 0~20	Adjusts the B GAIN of the Privacy zone area Adjusts the R GAIN of the Privacy zone area

◆ MOTION "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
SENSITIVITY	0~20	Sets the motion detection sensitivity
WINDOW TONE	0~6	Adjusts the transparency of the motion detection zone area
WINDOW USE	0~3	Select the Motion set number
WINDOW ZONE	OFF,ON	Active the Motion set number
DET H-POS DET V-POS DET H-SIZE DET V-SIZE	0~60 0~34 0~60 0~34	Adjust the size of the detection area

◆ OPTION "▲" "▼""◀" "▶"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
COM.	"ⓔ"	Sets the communication
IMAGE RANGE	Full,Comp,User"ⓔ"	Digital output data scale
OUTPUT MODE	1080P,720P,720_CROP	Sets the output format
FRAME RATE	30FPS,25FPS	Sets the frame rate
COLOR BAR	OFF,ON	Display Color bar pattern
CVBS	NTSC,PAL	Cvbs Output format
CVBS	OFF,ON	Cvbs on,off
LANGUAGE	English,Chinese,Chinese(S) Japanese,Korea	Selects the language in which to display the internal OSD menu
TITLE	OFF,ON"ⓔ"	Sets Camera TITLE
VERSION	477XE A5B	Camera VERSION display

■ COMMUNICATION "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
CAM ID	0~255	Digital output data scale
BAUDRATE	2400,4800,9600,57600,115200	Selects communication baudrate
SAVE	NG->ENT, OK->ENT	Reflects the communication setting value

■ IMAGE RANGE "▲" "▼""◀" "▶" "ⓔ"

"◀" "▶"

FUNCTION	OPTION	DESCRIPTION
IMAGE RANGE	0~20	Digital output data scale

■ **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.

3. UART Protocol

3-1. Connection

- ◆ Data Communication : **RS-485+/RS-485- Level**, Start-Stop Synchronized serial interface
- ◆ Data length : 8bit data
- ◆ Stop bit : 1 bit
- ◆ Parity : None
- ◆ Baudrate : **2400, 4800, 9600, 57600,11520 bps**

3-2. Communication Protocol

- ◆ All communication data consist of nine bytes.
- ◆ Communication Synch Byte with 0xFF/0xA0.
- ◆ Communication Address with 0x00.
- ◆ The format of the communication data is shown below.

7 Byte Fixed

Byte1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Sync Byte	**Address**	**Command1**	**Command2**	**Data1**	**Data2**	**Check sum**

◆Pelco-D

Data Byte	Type	Contents	Remarks
Byte 1	Sync Byte	0xFF	Data Packet Sync Byte
Byte 2	Address	Camera Address	0~255 ID Address
Byte 3	Command1	Target Commnand1	Menu On/Iris Colse/Iris Open
Byte 4	Command2	Target Command2	Down/Up/Left/Right
Byte 5	DATA 1	Target DATA1	Pan Speed(N/A)
Byte 6	DATA 2	Target DATA2	Tilt Speed(N/A)
Byte 7	Check Sum	Target Check Sum	2~6Byte Check Sum

◆Pelco-P

Data Byte	Type	Contents	Remarks
Byte 1	Sync Byte	0xA0	Data Packet Sync Byte
Byte 2	Address	Camera Address	0~255 ID Address
Byte 3	Command1	Target Commnand1	Menu On/Iris Colse/Iris Open
Byte 4	Command2	Target Command2	Down/Up/Left/Right
Byte 5	DATA 1	Target DATA1	Pan Speed(N/A)
Byte 6	DATA 2	Target DATA2	Tilt Speed(N/A)
Byte 7	Check Sum	Target Check Sum	2~6Byte Check Sum

3-3. Communication Command

◆ Byte2 Address ID Menu(0~255)Set

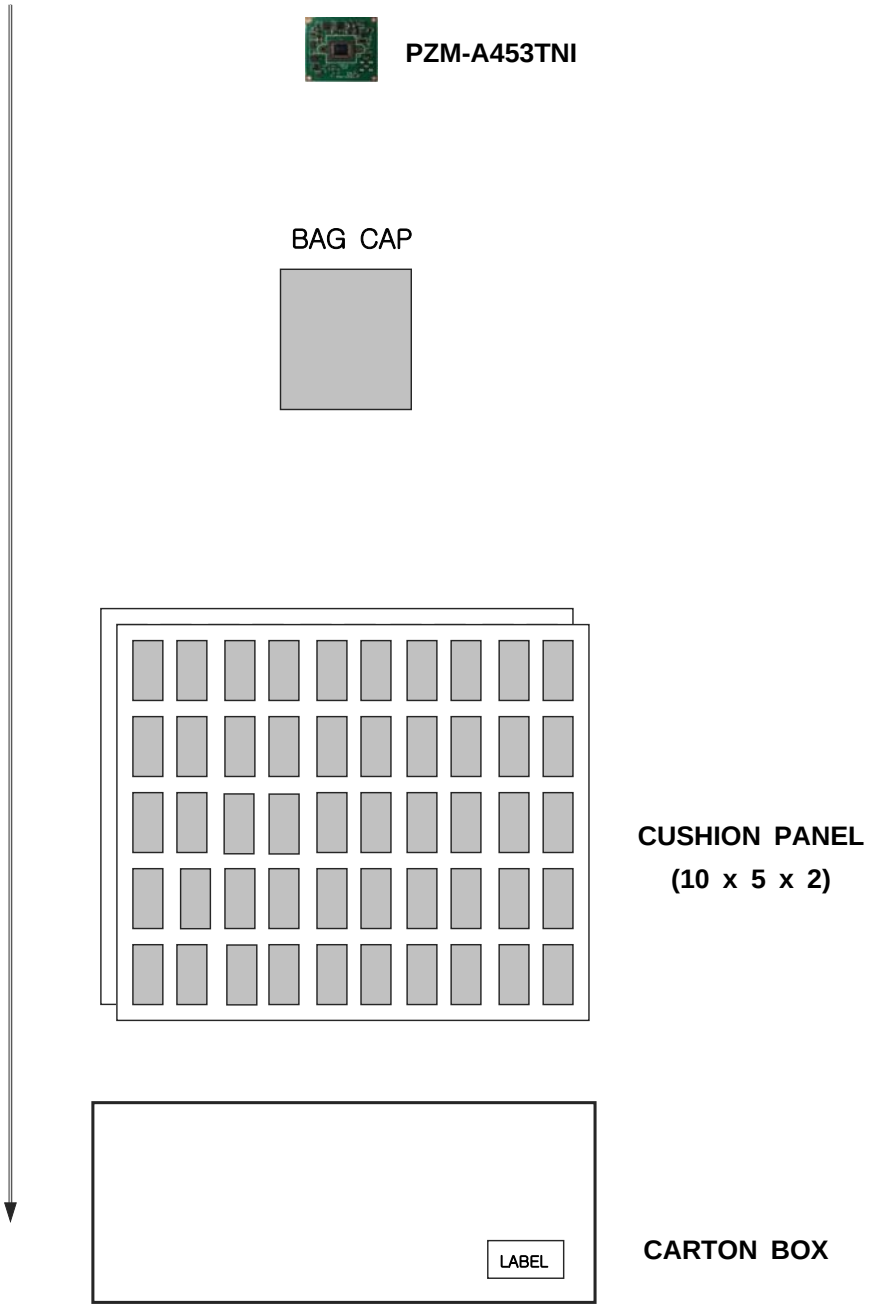
◆ **Pelco-D OSD Control Command**

NO	Category	Items	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
1	Numeric Key	Menu On	01	20	00	00	00	**CS**
			01	03	00	00	00	**CS**
			01	00	03	00	5F	**CS**
			01	00	07	00	5F	**CS**
			MENU ON/OFF					
2		Up Key	01	00	08	00	00	**CS**
3		Down Key	01	00	10	00	00	**CS**
4		Left Key	01	00	04	00	00	**CS**
5		Right Key	01	00	02	00	00	**CS**
6		Enter Key	01	60	00	00	00	**CS**
			01	02	00	00	00	**CS**

◆ **Pelco-P OSD Control Command**

NO	Category	Items	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
1	Numeric Key	Menu On	01	10	00	00	00	**CS**
			01	03	00	00	00	**CS**
			01	00	03	00	5F	**CS**
			01	00	07	00	5F	**CS**
			MENU ON/OFF					
2		Up Key	01	00	08	00	00	**CS**
3		Down Key	01	00	10	00	00	**CS**
4		Left Key	01	00	04	00	00	**CS**
5		Right Key	01	00	02	00	00	**CS**
6		Enter Key	01	40	00	00	00	**CS**
			01	04	00	00	00	**CS**

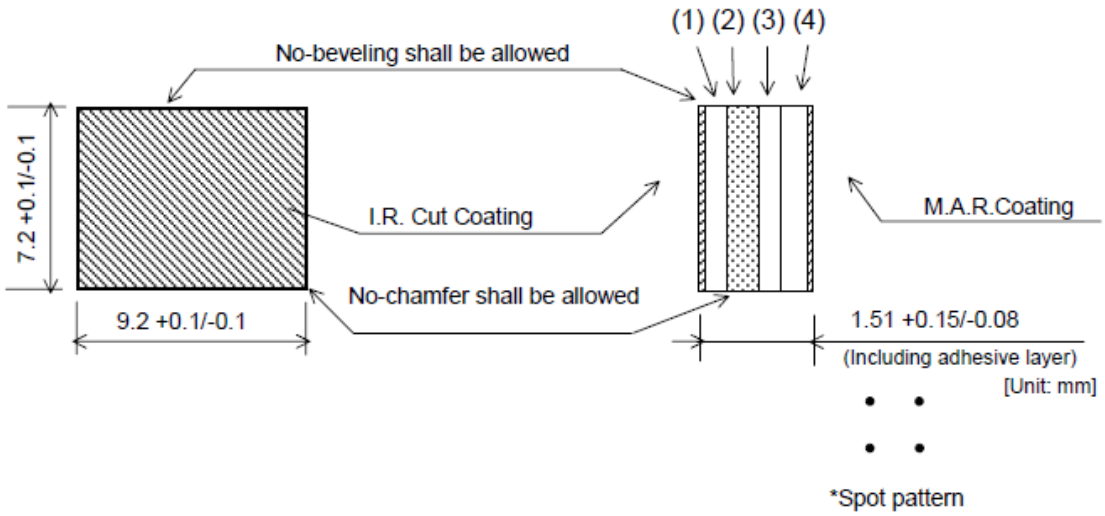
4. Packing Information



5. Reference Data Sheet

5-1. OLPF(Optical Low Pass Filter) Specifications

5-1-1. OLPF for general lens-1(OLPF Manufacturer : KDS)



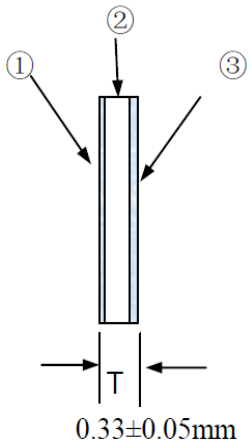
No.	Item	Thickness (㎜)	Orientation (degree)	Rotating Angle (degree)	Note
(1)	Double Refraction Plate	0.31 +0.02/-0.01	45 +1/-1	0 +1/-1	
(2)	Infrared Absorbing Glass	0.54 +0.03/-0.03	-	-	C5000(HOYA) or NF50(AGC)
(3)	Wave Plate	0.35 +0.03/-0.03	0 +1/-1	45 +1/-1	
(4)	Double Refraction Plate	0.31 +0.02/-0.01	45 +1/-1	90 +1/-1	

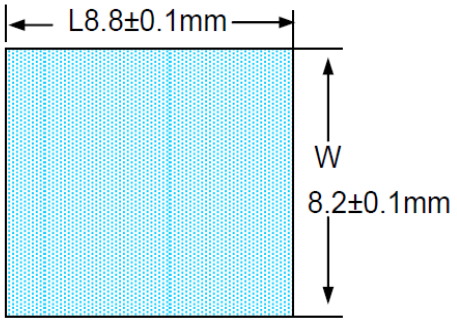
*Rotating angle of parts No. (3) is possible event by -45 +1/-1 degree.

Wavelength (nm)	400-450	450-500	500-550	655+15/-15	720-750	750-1050	1050-1100
Transmission Rate (%)	83min.(Avg.)	87min.(Avg.)	84min.(Avg.)	50	3max.	1max.(Avg.)	5max.
Ripple (%)	73min.	82min.	79min.	-	-	2max.	-

(Spectral characteristics of Optical Low Pass Filter)

5-1-2. OLPF for general lens-2(OLPF Manufacturer : Max Gain)

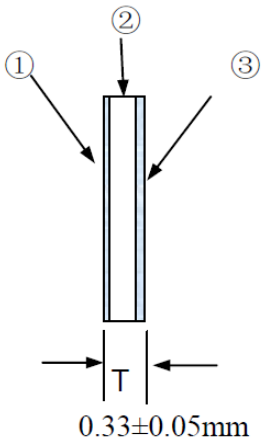


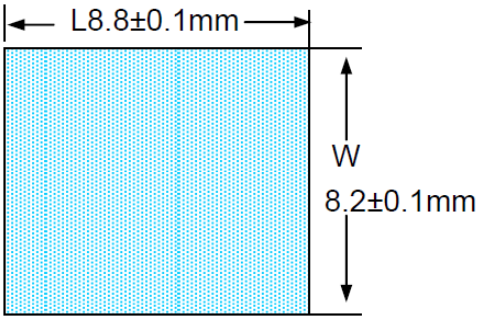


Part No	Part Name	Dimension(mm)			Orientation Angle	Rotation Angle	Flatness	Para.
		L	W	T				
①	IR Coating							
②	Double refractive plate	8.8±0.1	8.2±0.1	0.33±0.05	45	0	3N	2'
③	AR Coating							

Wave Length(nm)	Transmission (%)
400nm	＞75%
450~600nm	＞80%
645±10nm	=50%
700nm	＜5%
1100nm	＜15%

5-1-3. OLPF for TDN lens(OLPF Manufacturer : Max Gain)

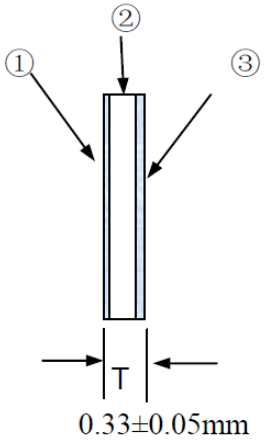


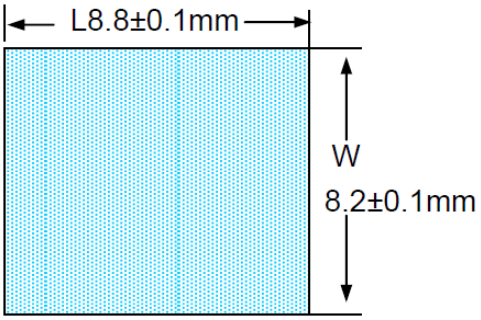


Part No	Part Name	Dimension(mm)			Orientation Angle	Rotation Angle	Flatness	Para
		L	W	T				
①	AR Coating							
②	Double refractive plate	8.8±0.1	8.2±0.1	0.33±0.05	45	0	3N	2'
③	AR Coating							

Wave Length(nm)	Transmission (%)
420~1100nm	>96%

5-1-4. OLPF for Night Vision(OLPF Manufacturer : Max Gain)



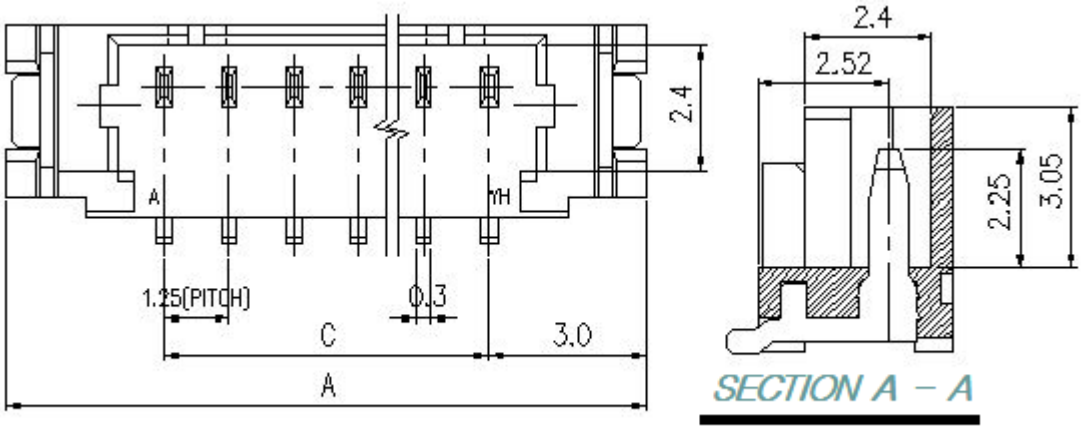


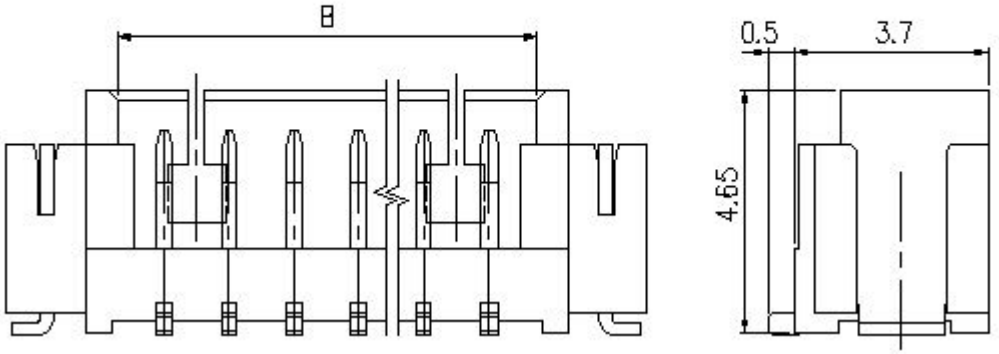
Part No	Part Name	Dimension(mm)			Orientation Angle	Rotation Angle	Flatness	Para
		L	W	T				
①	Night vision Coating							
②	Double refractive plate	8.8±0.1	8.2±0.1	0.33±0.05	45	0	3N	2'
③	AR Coating							

Wave Length(nm)	Transmission (%)
400-420	>75%
421-620	>85%
645±10	50%
700-750	<3%
815±15	50%
850	>80%
900-1100	<20%

5-2. I/O Connector Specifications

5-2-1. 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℃~+85℃
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