Messrs.		DATE	16,Feb, 2023
		Rev No.	1.1

PRELIMINARY APPROVAL SHEET

Description	Zoom Camera Series
Model Name	ATC-HZ8230T

Receipt stamp

PRELIMINARY

Aegis ELECTRONIC GROUP, INC

Phone: 760-729-2026

Revision History

Date	Rev. No	Contents
2023.02.10	1.0	Release Document (preliminary)
2023.02.16	1.1	Modify OSD Menu Context

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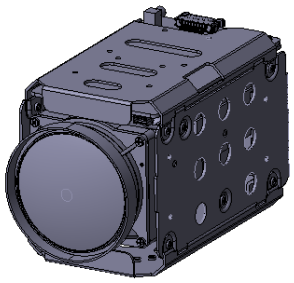
FEATURES

This Product is a high performance CCTV camera with built-in 30x optical zoom and 12x digital zoom technologies. This product can be applied to various fields such as security camera for surveillance (CCTV camera), data viewer, Video presenter(VP) and speed dome camera and industrial applications.

- This camera uses a 1/2.8" 2.13M STARVIS CMOS Image Sensor that supports HD (high definition) to produce high-quality images.
- Using progressive scan, images with a wide dynamic range can be obtained with the newly developed image signal processor (Wide Dynamic Range function, WDR).
- The camera is equipped with a bright zoom lens with 30× optical zoom and F1.6 aperture (optical zoom + digital zoom = 360×)
- Low-noise images can be obtained even in low-light environments using the Noise Reduction function(3DNR/2DNR/2DNR+3DNR)
- Video signals can be output as digital. Depending on register settings, you can select from a variety of digital output methods: 1080p/60,1080p/50,1080p/30, 1080p/25, 720p/60,720p/50,720p/30, 720p/25, 1080i/50, 1080i/60
- An infrared (IR) Cut-Filter can be disengaged from the image path for increased sensitivity in low light environments. The ICR will automatically engage depending on the ambient light, allowing the camera to be effective in day/night environment.
- A Privacy Zone Masking function (max. 8 blocks) is available.
- A Motion Detection function is available.
- A title composed of up to 21 lines can be set for displaying on the screen. 30 characters can be used on one line (VISCA).
- Support 256 internal zoom/focus presets.
- Digital Image Stabilizer function reduces image blurring caused by vibration.
- Output format
- HD-SDI/EX-SDI(V1.0/V2.0/V2.1/V3.0) LVDS/CVBS/AVI/TVI



ATC-HZ8230T

PRECAUTION

Operation is subject to the following conditions;

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.
- A regulated DC 12V 1A power supply is recommended for use with this camera for the best image and the most stable operation. An unregulated power supply can cause damage to the camera. When unregulated power supply is applied, product warranty will be out of subject.
- If it is used for CVBS application. It is recommended that the camera is used with a monitor that has a CCTV quality 75 Ohm video impedance level. If your monitor is switched to high impedance then please adjust accordingly.
- Do not attempt to disassemble the camera to gain access to the internal components. Refer servicing to tour dealer.
- Never face the camera towards the sun or any bright or reflective light, which may cause smear on the image and possible damage to the CMOS.
- Do not remove the serial sticker for the warranty service.
- Do not drop the thing or give a strong impact to the product.
- Avoid the place where is so dusty, humid or soot-covered. It may cause electric shock or fire.
- Do not expose to an intense light source such as direct sunlight or spotlight. It may damage the CMOS.
- If the camera operates more than 24 hours, It is recommended that you execute the lens initial action or reset the camera.

Information may be changed without notice

This document provides technical information for the user. KT&C reserves the right to modify the information in this document as necessary. The customer should make sure that they have the most recent manual version.

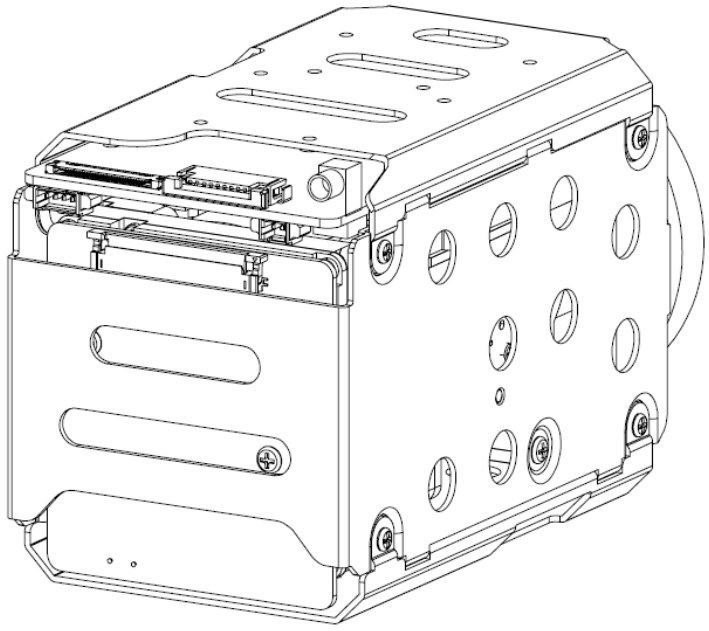
SPECIFICATIONS

Format / Model	ATC-HZ8230T-LTN
Video System	
Image Sensor	1/2.8″ 2.13M SONY Progressive Scan STARVIS CMOS
Effective Pixels	1945(H)x1097(V), Unit Cell Size(2.9㎛ X 2.9㎛)
Output Format	LVDS/HD-SDI/CVBS:1080p60/50/30/25, 720p60/50/30/25, 1080i60/50 EX-SDI:1080p30/25, 720p60/50/30/25 AVI:1080p30/25 TVI:1080p30/25, 720p30/25
Sensor Operating System	Sensor Master
Sync System	Internal
CVBS scale	16:9 / 4:3 (CVBS 960H)
LVDS mode	Single / Dual
Video Output	LVDS / CVBS
	HD-SDI / EX-SDI(1.0) / EX-SDI(2.0) / EX-SDI(2.1) / EX-SDI(3.0)
	HD-TVI
Min. illumination	(Sens-up Off, AGC 60dB)
Day	0.02 Lux @ F1.6
Night (IR-cut filter on)	0.01 Lux @ F1.6 (IR-cut filter on)
S/N ratio	More than 55 dB
Optical Lens	
Zoom Magnification	X30
Focal Length	4.3 to 129 mm
Horizontal-Angle	66.9°(W) ~ 2.5°(T)
Vertical Angle	39.7°(W) ~ 1.4°(T)
F-value	F1.6(W) ~ F5.0(T)
Zoom	
Maximum Zoom Ratio	x1 ~ x360
Optical Zoom Ratio	x1 ~ x30
Digital Zoom Ratio	x1 ~ x12
Digital Pan/Tilt	-
Speed (Focus Tracking On)	2.8 ~ 95 sec (default :3.6sec)
(Focus Tracking Off)	2.8 sec
Focus	
Control Mode	Auto / Manual / Interval / One Shot(=Zoom Trigger, One Push)
Focal Range	Infinity~ 1m(T)~0.01m(W)
IR correction	Standard/IR Light/user -20~+20
Day & Night	
D&N mode	Auto / Day (Color) / Night (BW) / External-H / External-L
White Balance	Auto / ATW / Indoor / Outdoor / Push / Manual
Exposure	
AE mode	Auto / Shutter Priority / Iris Priority/Manual
Brightness (Exp.Comp)	1~20
AGC Limit	OFF~80dB
Manual Shutter	1/1,1/2,1/4(3),1/8(6),1/15(12),1/30(25),1/60(50) ~ 1/30000
Manual AGC	OFF~80dB
Manual Iris	F1.6 ~ F19, Close
Sens-Up	Off ~ 32fields
ETC	Slow AE response

Format / Model	ATC-HZ8230T-LTN
DSP functions	
Digital Slow Shutter	Max. 32 fields
Image Freeze	Off / On
Image Reverse (E-FLIP)	Off / Horizontal(mirror) / Vertical / H+V(180° flip)
Privacy Masking	Spherical Privacy - 8-zone - Interlock / Non-Interlock Mask - 14 mask color selectable, semi-transparency - Pan(0°~360°), Tilt(+90°~-90°)
Motion Detect	4-Zone - Alarm output : OSD / Serial Communication
D-WDR	Off/ Low/Middle/High
WDR	Off/On, Adjustable(LEVEL: LOW/MIDDLE/HIGH)
BLC	Off / On, Area selectable
HLC	Off / On, Area selectable
AGC	Max.80dB, 0dB~80dB
Sharpness	Adjustable(0~15)
3DNR	On/Off (1~5)
2DNR	Auto/Manual
Defog	Off/Low/Middle/High
Gamma	0.45/0.50/0.55/0.60
Lens Shading	On / Off
Defect Detection	Support
Digital Image Stabilizer	On(Level:0~100) /Off
Picture Effect	NEGATIVE/Positive, Black&White(Monochrome Image)
Position Preset (zoom/focus)	Non-volatile 256 position(zoom/focus) presets.
Memory Preset	16-presets & custom preset
OSD Language	English,Japanese,China,Russian,Spanish,German,France,Portuguese
Coaxial Communication	TVI-UTC
Communication (UART)	
Camera ID	0~255
Remote Control	RS-232 TTL +5.0V (+3.3V Compatible)
Control Protocol	VISCA /Pelco-D/Pelco-P/HITACHI : automatically detection
Communication Speed	2400/4800/9600(default)/19200/38400/57600/115200bps selectable
Power	
Supply Voltage	DC 12V (+9.0V ~ +15V)
Supplied Current (motor on)	250mA(440mA)
Consumption (motor on)	3.0W(5.3W)
Physical	
WxHxD[mm], Weight[g]	
- Standard	50x58.8x90.5mm, Approx. 241g
Temperature& Humidity	
Operating condition	Temperature (-10°C~50 °C / 14°F~122°F), Humidity (Less than 90%)
Storage condition	Temperature (-20°C~60 °C / -4°F~140°F), Humidity (Less than 90%)

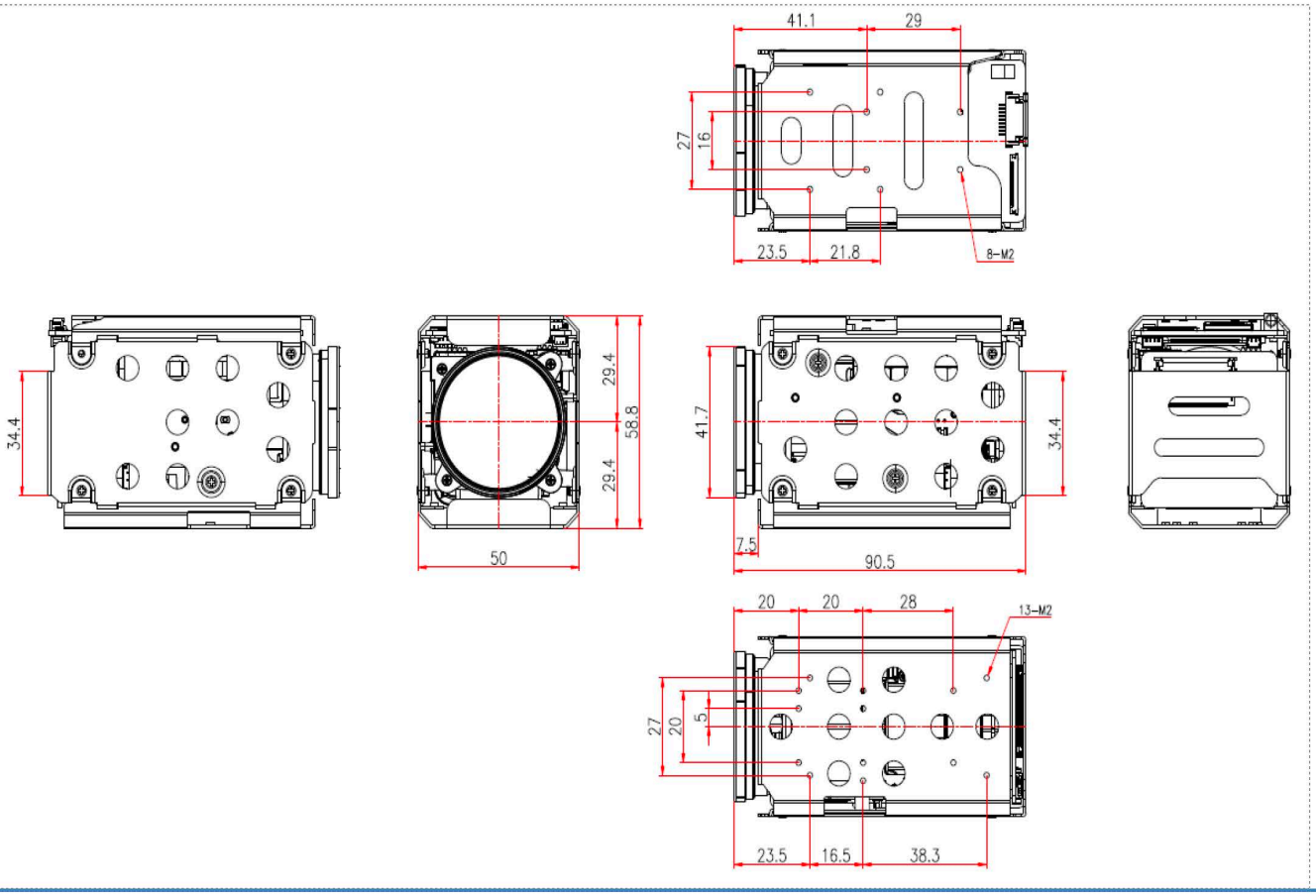
INTERFACE SUMMARY

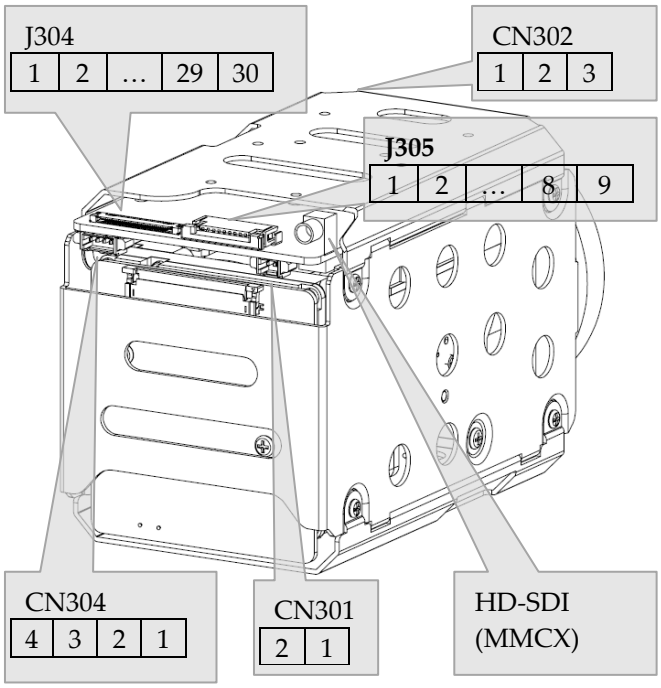
Interface & Video		ATC-HZ8230T-LTN	
Video Output	EX-SDI (V1.0 / V2.0 / V2.1 / V3.0)	O	
	HD-SDI	O	
	HD-TVI	O	
	HD-AVI	O	
	CVBS	O	
	LVDS	◎	
Interface	30pin Micro Coaxial (USL00-30L-A, 0.4mm)	◎	
	36pinFFC (FH12-36S-0.5SH, 0.55mm)		
	9pinFFC (52207-0933, 1.0mm)	O	
	3pin External D&N (SM03B-SRSS-TB,1.0mm)	O	
	4pin AVI / TVI (53261-0471, 1.25mm)	O	
	2pin RS-485 (53261-0271, 1.25mm)	O	
	MMCX	O	

ATC-HZ8230T-LTN


DIMENSION

DIMENSIONS ATC-HZ8230T-LTN





CN304 (TVI/AVI) / Molex : 53261-0471

NO	Name	Description
1	+12V_IN	DC 12V Input
2	GND	GND (DC12V)
3	TVI/AVI OUTPUT	TVI / AVI Output(Select On OSD)
4	GND	GND (TVI / AVI)

J304 (LVDS) / (Micro Co- Axial) USL00-30L-C

NO	Name	Description
1	TX_OUT3+	
2	TX_OUT3-	
3	TX_CLKOUT+	LVDS_CLK
4	TX_CLKOUT-	LVDS_CLK
5	TX_OUT2+	
6	TX_OUT2-	
7	TX_OUT1+	
8	TX_OUT1-	
9	TX_OUT0+	
10	TX_OUT0-	
11	GND	
12	TXD	5.0V (compatible 3.3V)
13	RXD	5.0V (compatible 3.3V)
14	+12V DC	
15	+12V DC	
16	+12V DC	
17	+12V DC	
18	+12V DC	
19	GND	
20	GND	
21	TX_OUT7+	Single out mode : open
22	TX_OUT7-	Single out mode : open
23	TX_OUT6+	Single out mode : open
24	TX_OUT6-	Single out mode : open
25	CVBS	CVBS Out
26	RESET_IN	Reset:Low(GND),Normal(1.8V)
27	TX_OUT5+	Single out mode : open
28	TX_OUT5-	Single out mode : open
29	TX_OUT4+	Single out mode : open
30	TX_OUT4-	Single out mode : open

J305 (TVI/AVI) / Molex : 52207-0933

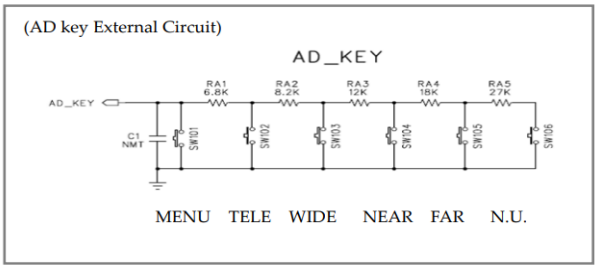
NO	Name	Description
1	GND	(Optional RS485EN or AD KEY)
2	TVI/AVI OUTPUT	TVI / AVI Output(Select On OSD)
3	GND	
4	CVBS_OUT	CVBS Output
5	GND	
6	+12V_IN	DC 12V Input
7	GND	
8	TXD	5.0V (compatible 3.3V)
9	RXD	5.0V (compatible 3.3V)

CN302 (External D&N) / JST : SM03B-SRSS-TB

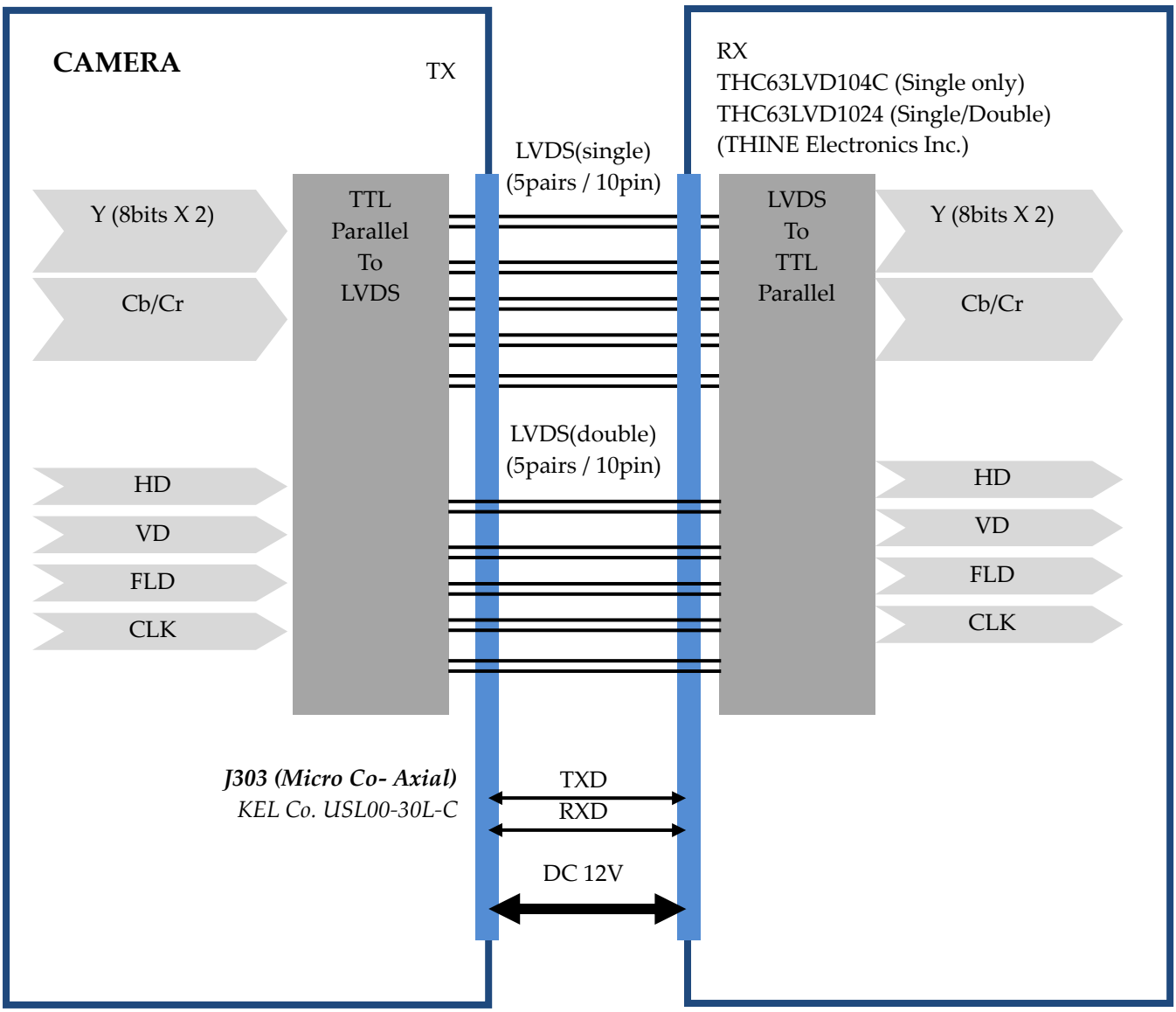
NO	Name	Description
1	EXT_DN	External D&N Input
2	GND	
3	+3.3V	+3.3V Out(For Sensor)

CN301 (RS485) / 53261-0271

NO	Name	Description
1	TRX+	RS485 TRX+
2	TRX-	RS485 TRX-



LVDS interface (LVDS model only)



HD Digital Video Sync Signal
74.125MHz

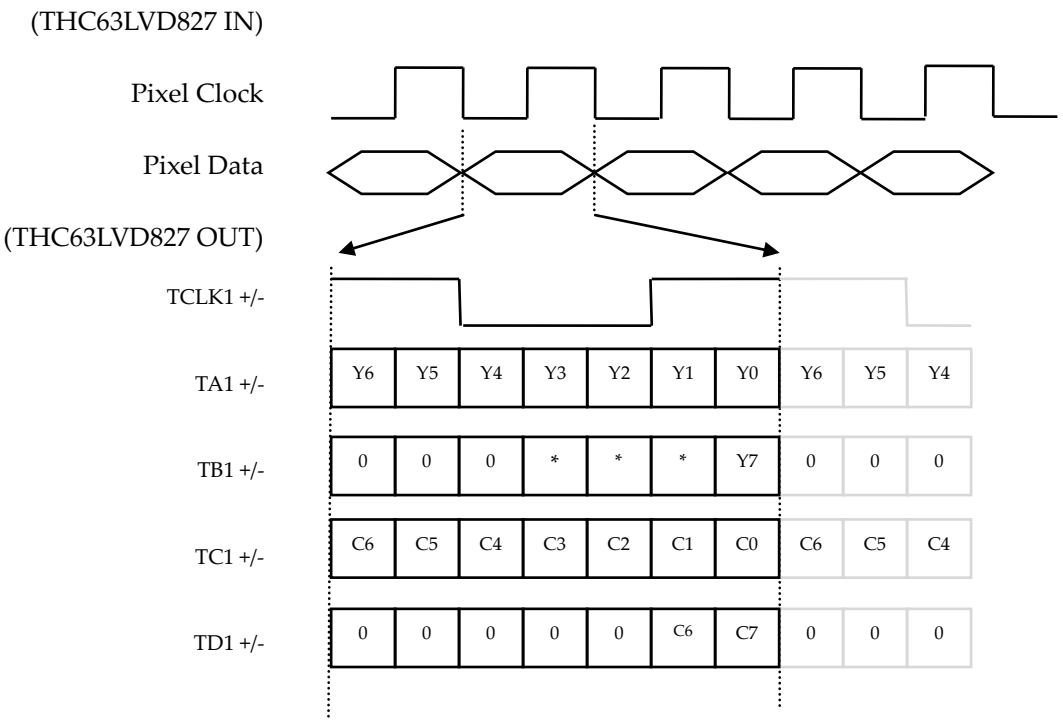
Recommended LVDS receiver IC
(1) Single Only : THC63LVD104C
(2) Single or Double : THC63LVD1024

Select LVDS output mode
(1) MENU
SPECIAL -> SYSTEM -> LVDS MODE : SINGLE/DUAL
(2) VISCA protocol
8x 01 04 24 74 0p 0q FF : pq=00 (single) / pq=01 (double)

(caution) If the frame rate is 25 fps / 30 fps, it works as SINGLE even if LVDS MODE is set to DUAL.
However, if the frame rate is 50 fps / 60 fps, LVDS MODE must be set to DUAL to operate as DUAL.

LVDS Pixel Data Format (LVDS model only)

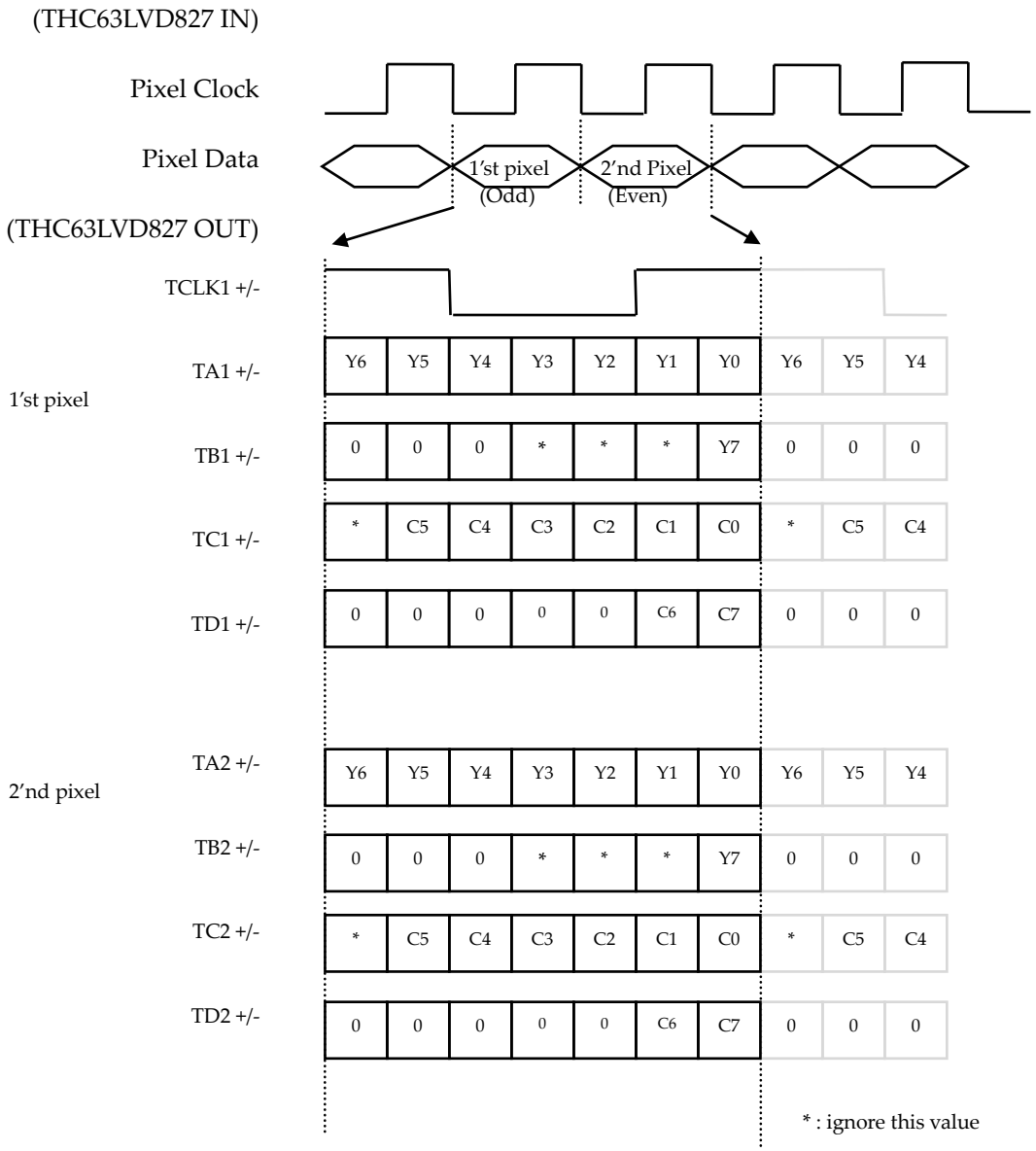
Single Mode : THC63LVD827 (THINE Electronics Inc.)



* : ignore this value

Output Format	Pixel Clock [MHz]	TCLK+ [MHz]
1080p60	148.5	148.5
1080p50	148.5	148.5
1080i60	74.25	74.25
1080i50	74.25	74.25
1080p30	74.25	74.25
1080p25	74.25	74.25
720p60	74.25	74.25
720p50	74.25	74.25
720p30	74.25	74.25
720p25	74.25	74.25

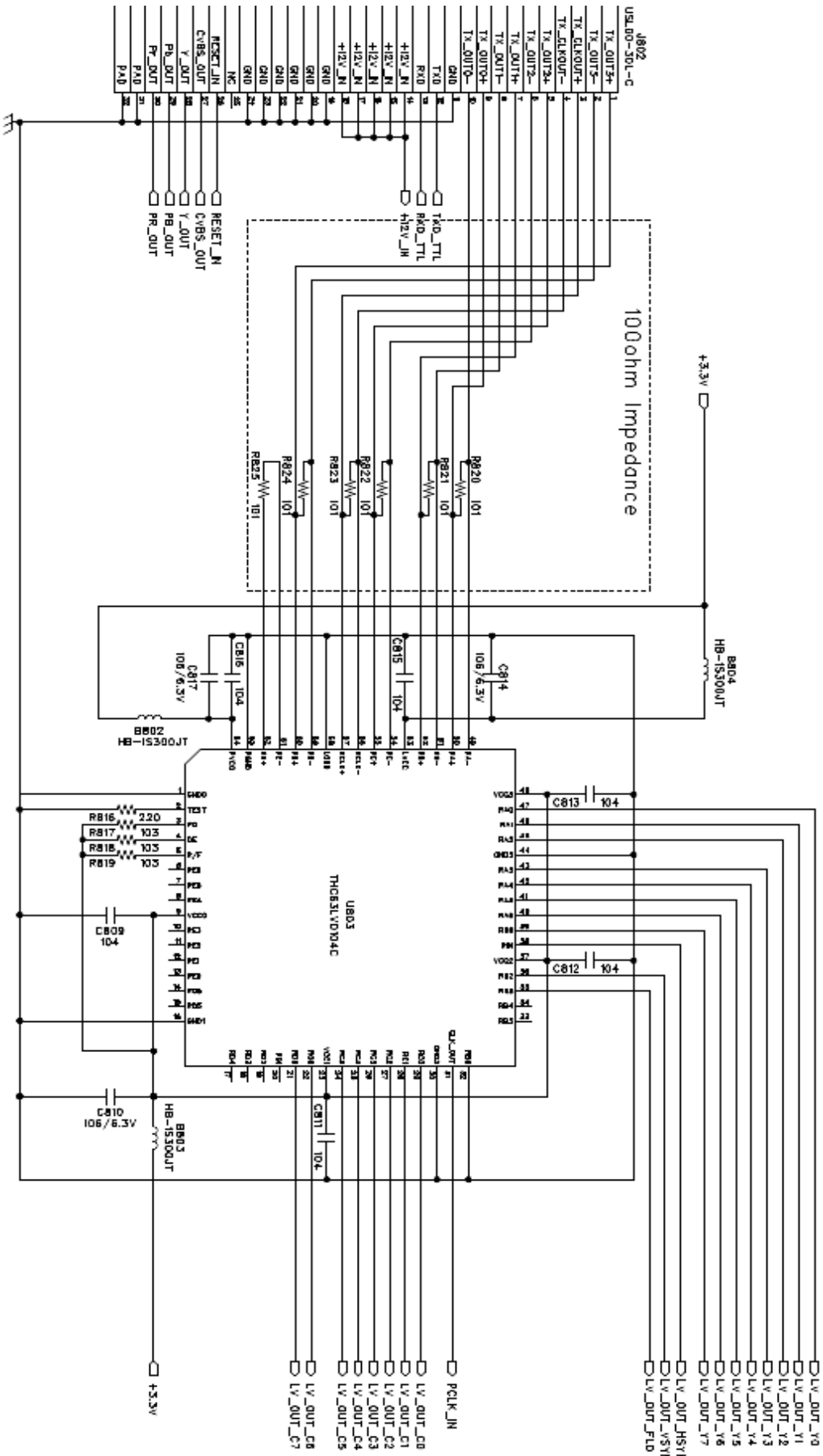
Double Mode : THC63LVD827 (THINE Electronics Inc.)



Output Format	Pixel Clock [MHz]	TCLK+ [MHz]
1080p60	148.5	74.25
1080p50	148.5	74.25
1080i60	74.25	37.125
1080i50	74.25	37.125
1080p30	74.25	37.125
1080p25	74.25	37.125
720p60	74.25	37.125
720p50	74.25	37.125
720p30	74.25	37.125
720p25	74.25	37.125

LVDS Receive Circuit Example (LVDS model only)

LVDS Single Output receiver circuit example / Receiver IC : THC63LVD104C

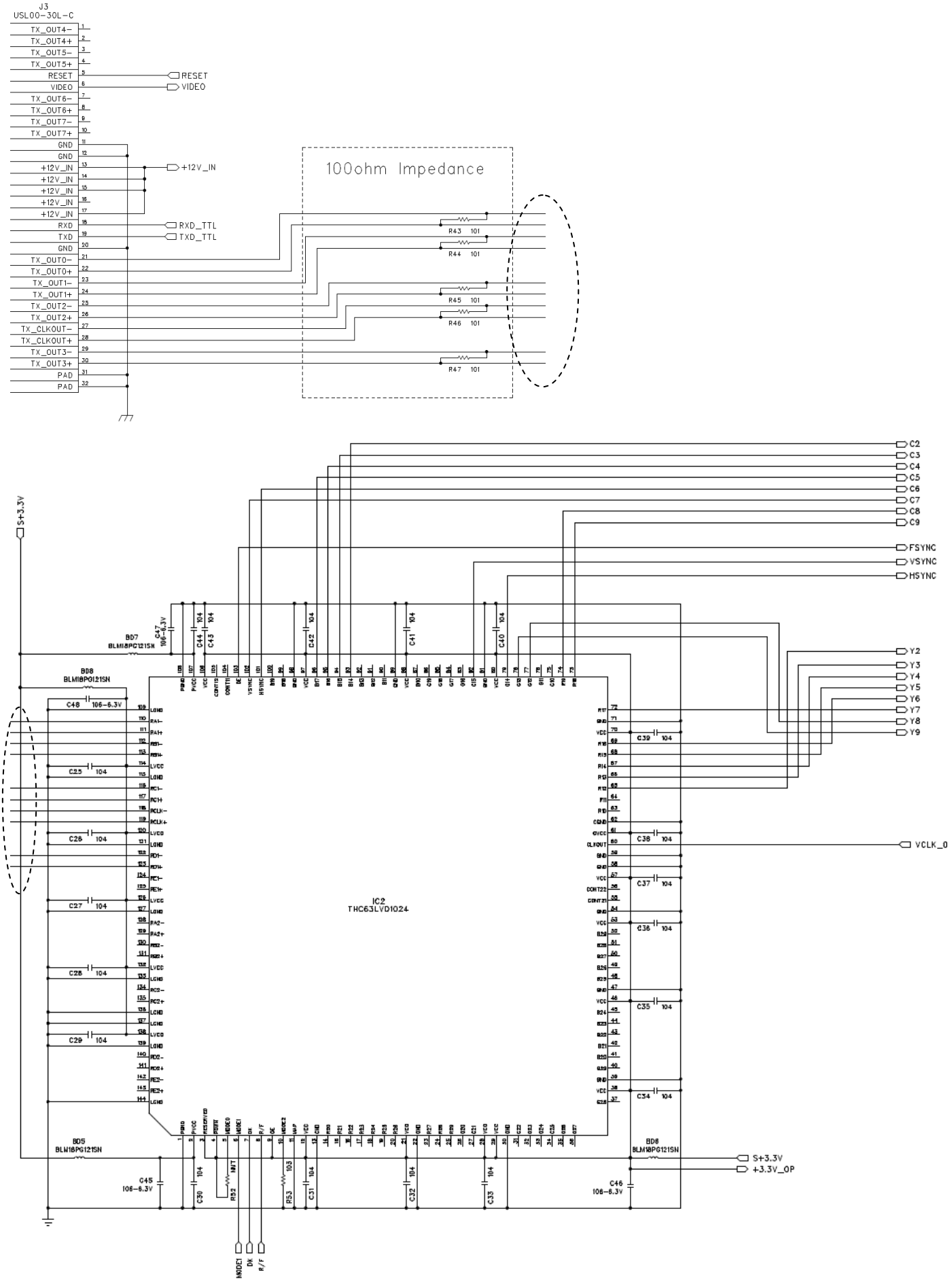


LVDS Single Output receiver circuit example / Receiver IC Pin Assign : THC63LVD104C

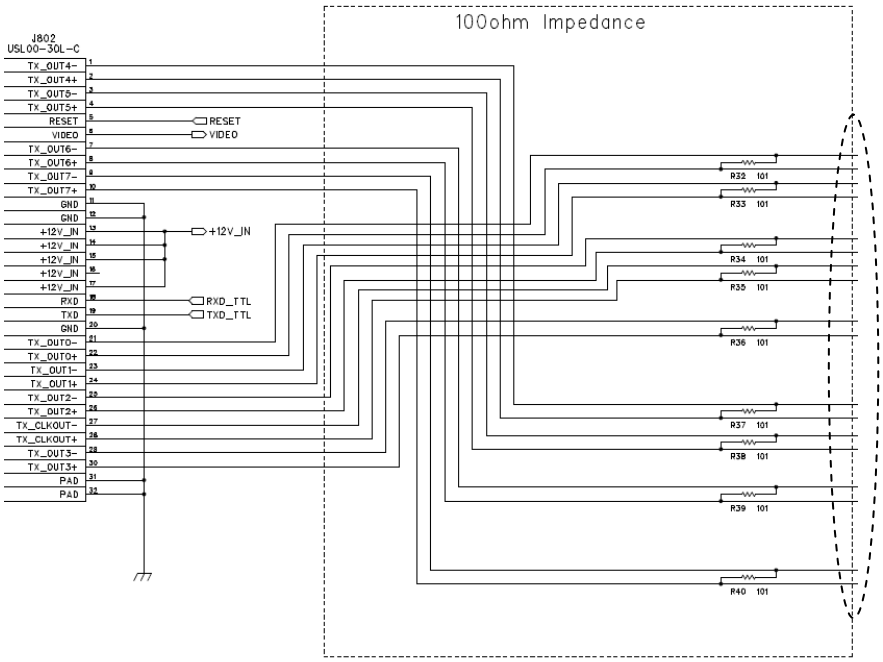
Pin No.	Description	Signal
1	GND0	
2	TEST	
3	PD	
4	OE	
5	R/F	
6	RE6	
7	RE5	
8	RE4	
9	VCC0	
10	RE3	
11	RE2	
12	RE1	
13	RE0	
14	RD6	
15	RD5	
16	GND1	
17	RD4	
18	RD3	
19	RD2	
20	RD1	
21	RD0	C7
22	RC6	C6
23	VCC1	
24	RC5	C5
25	RC4	C4
26	RC3	C3
27	RC2	C2
28	RC1	C1
29	RC0	C0
30	GND2	
31	CLK_OUT	PCLK
32	RB6	

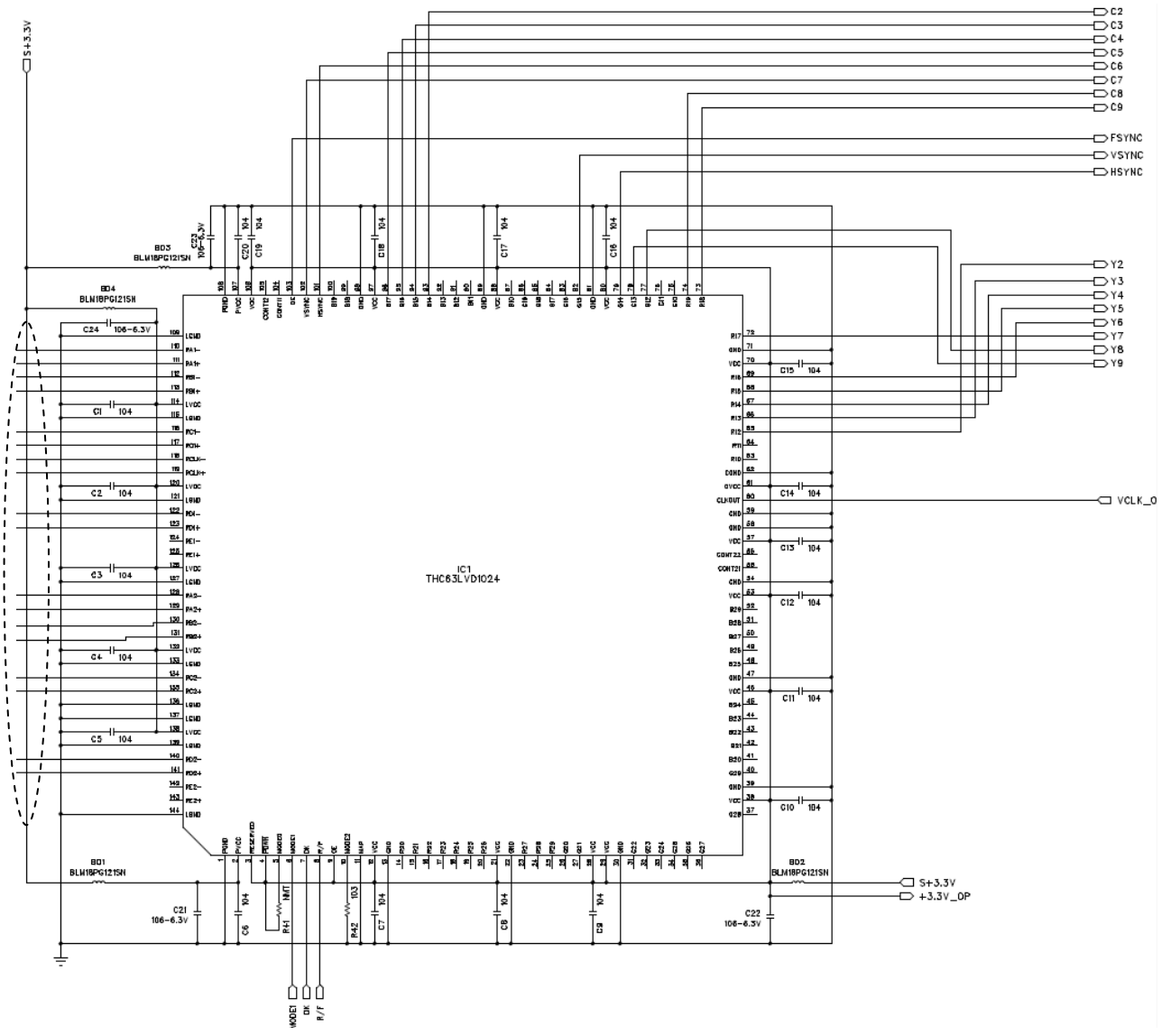
Pin No.	Description	Signal
33	RB5	
34	RB4	
35	RB3	FLD
36	RB2	VSYNC
37	VCC2	
38	RB1	HSYNC
39	RB0	Y7
40	RA6	Y6
41	RA5	Y5
42	RA4	Y4
43	RA3	Y3
44	GND3	
45	RA2	Y2
46	RA1	Y1
47	RA0	Y0
48	VCC3	
49	RA-	TXOUT0-
50	RA+	TXOUT0+
51	RB-	TXOUT1-
52	RB+	TXOUT1+
53	LVCC	
54	RC-	TXOUT2-
55	RC+	TXOUT2+
56	RCLK-	TXCLKOUT-
57	RCLK+	TXCLKOUT+
58	LGND	
59	RD-	TXOUT3-
60	RD+	TXOUT3+
61	RE-	
62	RE+	
63	PGND	
64	PVCC	

LVDS Single Output receiver circuit example / Receiver IC : THC63LVD1024



LVDS Double Output receiver circuit example / Receiver IC : THC63LVD1024





LVDS Single/Double Output receiver circuit example / Receiver IC Pin Assign : THC63LVD1024

Pin No.	Description	Signal
1	PGND	
2	PVCC	
3	RESERVED	
4	PDWN	
5	MODE0	
6	MODE1	MODE1
7	DK	DK
8	R/F	R/F
9	OE	
10	MODE2	
11	MAP	
12	VCC	
13	GND	
14	R20	
15	R21	
16	R22	
17	R23	
18	R24	
19	R25	
20	R26	
21	VCC	
22	GND	
23	R27	
24	R28	
25	R29	
26	G20	
27	G21	
28	VCC	
29	VCC	
30	GND	
31	G22	
32	G23	
33	G24	
34	G25	
35	G26	
36	G27	
37	G28	
38	VCC	
39	GND	
40	G29	
41	B20	
42	B21	
43	B22	
44	B23	
45	B24	
46	VCC	
47	GND	
48	B25	
49	B26	
50	B27	

Pin No.	Description	Signal
51	B28	
52	B29	
53	VCC	
54	GND	
55	CONT21	
56	CONT22	
57	VCC	
58	GND	
59	GND	
60	CLKOUT	VCLK
61	CVCC	
62	CGND	
63	R10	
64	R11	
65	R12	Y2
66	R13	Y3
67	R14	Y4
68	R15	Y5
69	R16	Y6
70	VCC	
71	GND	
72	R17	Y7
73	R18	C9
74	R19	C8
75	G10	
76	G11	
77	G12	Y8
78	G13	Y9
79	G14	HSYNC
80	VCC	
81	GND	
82	G15	VSYNC
83	G16	
84	G17	
85	G18	
86	G19	
87	B10	
88	VCC	
89	GND	
90	B11	
91	B12	
92	B13	
93	B14	C2
94	B15	C3
95	B16	C4
96	B17	C5
97	VCC	
98	GND	
99	B18	
100	B19	

Pin No.	Description	Signal
101	HSYNC	C6
102	VSYNC	C7
103	DE	FSYNC
104	CONT11	
105	CONT12	
106	VCC	
107	PVCC	
108	PGND	
109	LGND	
110	RA1-	TXOUT0-
111	RA1+	TXOUT0+
112	RB1-	TXOUT1-
113	RB1+	TXOUT1+
114	LVCC	
115	LGND	
116	RC1-	TXOUT2-
117	RC1+	TXOUT2+
118	RCLK-	TXCLKOUT-
119	RCLK+	TXCLKOUT+
120	LVCC	
121	LGND	
122	RD1-	TXOUT3-
123	RD1+	TXOUT3+
124	RE1-	
125	RE1+	
126	LVCC	
127	LGND	
128	RA2-	TXOUT4-
129	RA2+	TXOUT4+
130	RB2-	TXOUT5-
131	RB2+	TXOUT5+
132	LVCC	
133	LGND	
134	RC2-	TXOUT6-
135	RC2+	TXOUT6+
136	LGND	
137	LGND	
138	LVCC	
139	LGND	
140	RD2-	TXOUT7-
141	RD2+	TXOUT7+
142	RE2-	
143	RE2+	
144	LGND	

OSD & MENU

1'ST ITEM	2'ND ITEM	3'RD ITEM or DATA	4'TH ITEM or DATA	5'TH ITEM or DATA
FOCUS	AF MODE	AUTO/INTERVAL/ONE PUSH/MANUAL		
	DZOOM	OFF/ON		
	ZOOM START	1~30		
	ZOOM STOP	1~360		
	ZOOM SPEED	0~7		
	FOCUS LIMIT	1CM/10CM/50CM/1M/1.2M/1.3M/1.5M/2M/3M/5M/10M/50M/100M/500M/INF		
	AF INTERVAL	1~255		
	HOME POSITION	OFF/ON		
	IR CORRECT	STANDARD/IR LIGHT/USER -20~+20		
	CONT. AF MODE	OFF/ON		
	CONT. AF SPEED	0~16		
	INITIAL			
	RETURN			
EXPOSURE	AE MODE	AUTO/SHUT.PRI/IRIS.PRI/MANUAL		
	FLICKERLESS	OFF/ON		
	IRIS	CLOSE~F19		
	SHUTTER	1/1~1/30000		
	AGC	OFF ~ 80dB		
	AGC MAX	OFF ~ 80dB		
	SENS-UP MAX	OFF/X2/X4/X8/X16/X32		
	BRIGHTNESS	1~20		
	INITIAL			
	RETURN			
WHITE BALANCE	MODE	AUTO/INDOOR/OUTDOOR/ONE PUSH/ATW/MANUAL		
	PUSH	PRESS OK/WAIT		
	COLOR GAIN	0~20		
	RED GAIN	0~255		
	BLUE GAIN	0~255		
	INITIAL			
	RETURN			
WDR/BLC	BACKLIGHT	OFF/BLC/HLC/WDR		
	BLC SET	LEVEL	0~10	
		BLC POSITION-X	0~20	
		BLC POSITION-Y	0~20	
		BLC SIZE-X	0~20	
		BLC SIZE-Y	0~20	
	HLC SET	LEVEL	0~20	
		COLOR	BLACK/WHITE/YELLO/CYAN/GREEN/MAGENTA/RED/BLUE	
	WDR SET	LEVEL	LOW/MIDDEL/HIGH	
	ININTIAL			
	RETURN			
DAY&NIGHT	MODE	AUTO/DAY(COLOR)/NIGHT(BW)/EXT-H/EXT-L		
	DWELL TIME	0~255		
	DAY->NIGHT	2~255		
	NIGHT->DAY	1~254		
	IR SMART	0~20		

	INITIAL			
	RETUEN			
IMAGE	SHARPNESS	0~15		
	GAMMA	0.45/0.5/0.55/0.6		
	MIRROR	OFF/H-FLIP/V-FLIP/HV-FLIP		
	FREEZE	OFF/ON		
	D-WDR	OFF/LOW/MIDDLE/HIGH		
	DEFOG	MODE	OFF/MANUAL/AUTO	
		LEVEL	LOW/MIDDLE/HIGH	
		RETURN		
	SHADING	MODE	ON/OFF	
		SHADING LEVEL	0~100	
		RETURN		
	DNR	3DNR MODE	OFF/AUTO/MANUAL	
		3DNR LEVEL	0~2	
		3DNR GAIN	0~255	
		3DNR THLD	0~255	
		3DNR FK	0~255	
		2DNR MODE	OFF/AUTO/MANUAL	
		2DNR LEVEL	0~2	
		2DNR GAIN	0~255	
		2DNR THLD	0~255	
		RETURN		
	DIS	MODE	OFF/ON	
		RANGE	10%~30%	
		FILTER	LOW/MIDDLE/HIGH	
		AUTO C	OFF/HALF/FULL	
		RETURN		
	EFFECT	PIC. EFFECT	OFF/NEGATIVE/BW	
		HR MODE	OFF/ON	
		RETURN		
	INITIAL			
	RETURN			
SPECIAL	CAM TITLE	EDIT PANEL ↓ _ _ _ _ _ _ _ _ _ _ _ _ _ _ A B C D E F G H I J K L M N O P Q R S T U V W X Y Z ! ? 0 1 2 3 4 5 6 7 8 9 ~ ( ) ^ SP> <BK		
		DISPLAY	OFF/ON	
		POSITION	[POSITION EDIT]	
		RETURN		
	DISPLAY	ZOOM RATIO	OFF/ON	
		ZOOM RATIO POS	[POSITION EDIT]	
		CAMERA ID	OFF/ON	
		CAMERA ID POS	[POSITION EDIT]	
		INITIAL		
		RETURN		
	MOTION	MODE	OFF/ON	
		ZONE NO	1~4	
		ZONE DETECT	OFF/ON	
		X-POSITION	0~60	
		Y-POSITION	0~34	
		X-SIZE	0~60	
		Y-SIZE	0~34	
		SENSITIVITY	0~10	
		ALARM MODE	OFF/OSD/TEXT/OSD&TEXT	

		INITIAL		
		RETURN		
	INITIAL			
	RETURN			
SYSTEM (*)It is not initialized by "Factory default"	FRAMERATE	1080p25/30/50/60, 1080i50/60, 720p25/30/50/60		
	DVR	STANDARD / CVBS / USER / HIKVISON B / HIKVISON A / WEBGATE / RAYSHARP / STANDARD / FOCUS / RAYSHARP / TAGATEC / TECHWIN / 3R / CHN		
	SDI	OFF/HDSDI-1.5G/HDSDI-3G/EXSDI-135M~EXSDI-1.5G		
	VIDEO TYPE	TVI/AVI		
	LANGUAGE	ENGLISH / Русский / Español / DEUTSCH / FEANCAISE / Português / 中国 / 日本語		
	CVBS	4:3/16:9		
	LVDS MODE	SINGLE/DUAL		
	IR CORRECT	STANDARD/IR LIGHT/USER -20~+20		
	COLOR	BYGAIN-	0~255	
		BYGAIN+	0~255	
		RYGAIN-	0~255	
		RYGAIN+	0~255	
		BYHUE-	0~255	
		BYHUE+	0~255	
		RYHUE-	0~255	
		RYHUE+	0~255	
		RED GAIN	0~255	
		GREEN GAIN	0~255	
		BLUE GAIN	0~255	
		RESET		
		RETURN		
	COM	CAM ID	0~255	
		BAUDRATE	2400/4800/9600(default)/19200/38400/57600/115200bps	
		RS-485	OFF/ON	
		APPLY	YES/NO	
		RETURN		
	RETURN			
FACTORY DEF	YES / NO			
EXIT				

FUNCTIONS

(!!!) Memory Control Function Priority

Function	Priority	Etc
D-ZOOM	1	Digital Zoom Function
WDR	2-2	Wide Dynamic Range
DIS	2-2	Digital Image Stabilizer
PIP	2-3	Picture In Picture
COR.VIEW	3	Corridor View. It is not H-FILIP / V-FLIP / HV-FLIP.

* Digital Zoom : Highest Priority
When D-ZOOM is ON, DIS and COR.VIEW are unconditionally turned OFF.

D-ZOOM	WDR	DIS	PIP	COR.VIEW
OFF	O	O	O	O
ON	O	X	O	X

* WDR / DIS / PIP will activate the later ON function. If multiple functions are ON at the same time, it will be turned on in WDR / DIS / PIP order. However, DIS is unconditionally turned off when D-ZOOM is turned on.

D-ZOOM	WDR	DIS	PIP	COR.VIEW
---	OFF	ON/OFF	ON/OFF	ON/OFF
---	ON	OFF	OFF	OFF

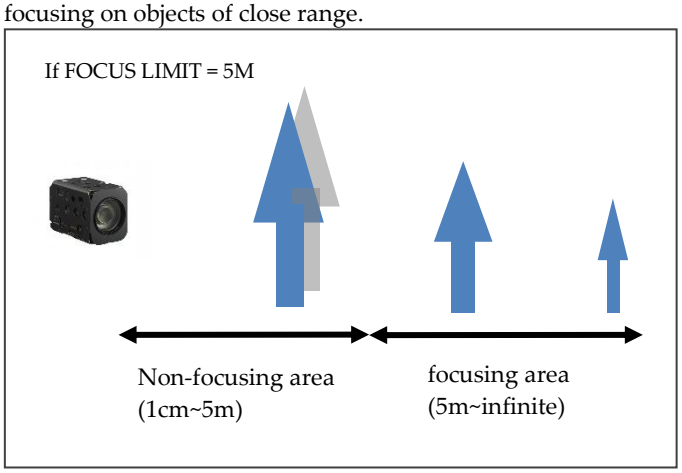
D-ZOOM	DIS	WDR	PIP	COR.VIEW
---	OFF	ON/OFF	ON/OFF	ON/OFF
---	ON	OFF	OFF	OFF

D-ZOOM	PIP	WDR	DIS	COR.VIEW
---	OFF	ON/OFF	ON/OFF	ON/OFF
---	ON	OFF	OFF	OFF

* Corridor VIEW can be controlled only when both D-ZOOM / WDR / DIS / PIP are OFF.
* Corridor VIEW does not work on 1080p50 / 60.

Auto Focus Near Limit

You can set the minimum focus distance from 1cm(or 10cm) to infinite. It is available only at high magnification zoom position.
This is called by FOCUS LIMIT or NEAR LIMIT or M.O.D (Minimum object distance). This is mostly used to avoid focusing on objects of close range.



Auto Focus Mode

- AUTO
  When a change in the image is detected, the AF operation is automatically performed.
- INTERVAL
  It is used for AF movements carried out at particular intervals.
- MANUAL
  Adjust zoom and focus manually.
- ONESHOT
  When the zoom is changed, auto focus is executed only once.
  The AF range is from FOCUS LIMIT to infinity.
  It is called by “ONE PUSH” or “ZOOM TRIGGER” mode.
- PRESET

Always focus on the specified subject. When the zoom is changed, auto focus is executed only once. The AF range (=PRESET MARGIN) is limited to a specific range.

Home Position Mode

After power on, you can choose whether to move to the last position before power off or to x1 position.

KT_HomePowerOn	On	8x 01 70 24 02 FF	Moving to x1 position
	Off	8x 01 70 24 03 FF	Move to final position before power off

Automatic Exposure Mode

● Full Auto mode
Iris, Gain, Shutter speed can be set automatically.

● Shutter Priority mode
Variable shutter speed : 1/1(X32)~1/10000
Auto Iris & Gain

● Iris Priority mode
Variable Iris : F19 ~ Close, 18steps
Auto Gain & Shutter

● Manual mode
Variable Iris/Shutter/Gain

●AE Mode : AUTO/IRIS.PRI/SHUT.PRI/AGC.PRI/MANUAL

MODE	AUTO	IRIS.PRI	SHUT.PRI	MANUAL
SHUTTER	X	X	O	O
IRIS	X	O	X	O
AGC	X	X	X	O
AGC MAX	O	O	O	X
FLICKERLESS	O	O	X	X
SENS UP MAX	O	O	X	X
AE RESPONSE	O	X	X	X

(NOTE) See "Command Setting Values"

Exposure Compensation

It is a function which offsets the internal reference brightness level used in the AE mode.

CAM_ExpComp	8x 01 04 4E 00 00 0p 0q FF	pq=compensation level

(NOTE) See "Command Setting Values"

Wide Dynamic Range (WDR)

Images with WDR are produced by combining long-exposure signals(normal shutter) with the signal of the high-intensity portions obtained a short-exposure (high-speed shutter).


WDR OFF


WDR ON

Back-Light Compensation(BLC)

BLC allows the camera to adjust the exposure of the entire image to properly expose the subject in the foreground.


BLC OFF


BLC ON

High-Light Compensation (HLC)

It's ability to reverse bright points in the picture to black. As an effective approach to recognize vehicle plate number at night, HLC function can detect any spotlight diffused by object-vehicle and compensate it for obtaining clearer image.


HLC Off


HLC On

Digital WDR

Digital Wide Dynamic Range gives the camera the ability to view Dark areas of the given image as well as extremely lighted portions of the image, or areas of high contrast.

KT_DwdrMode	8x 01 70 4B 0p FF	p=0(OFF) 1(ON), 2(AUTO)
KT_DwdrOnLevel	8x 01 70 4C 0p FF	p=0~16
KT_DwdrAutoLevel	8x 01 70 4D 0p FF	p=0(HIGH)~2(LOW)

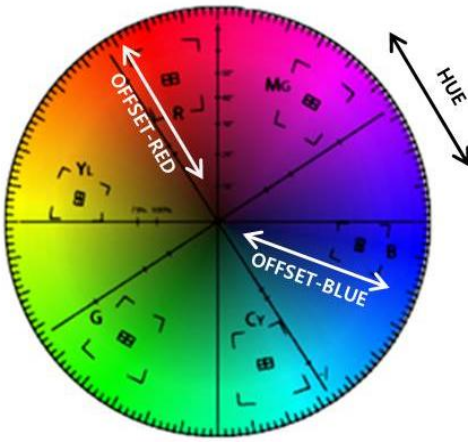
White Balance

There is a difference between the colors that people perceive and the colors that the camera recognizes. White Balance is used to overcome or reduce the difference.

■WD Mode

CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor	8x 01 04 35 01 FF	Indoor mode
	Outdoor	8x 01 04 35 02 FF	Outdoor mode
	OnePushWB	8x 01 04 35 03 FF	One Push WB mode
	ATW	8x 01 04 35 04 FF	ATWmode
	Manual	8x 01 04 35 05 FF	Manual mode

● AUTO
Automatically adjusts color. Setting offset-blue and offset-red(0~50).



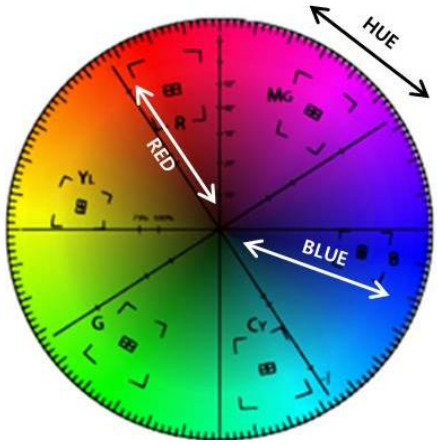
KT_WbBlueoffset	-	8x 01 71 51 pp FF	pp : Blue offset (0x00~0x64)
KT_WbRedoffset	-	8x 01 71 52 pp FF	pp : Red offset (0x00~0x64)

● ONE PUSH
Fix the color if pressed PUSH button

●INDOOR / OUTDOOR
Set color temperature to be indoor/outdoor light.

● ATW
Auto Trace White balance

● MANUAL
Adjust color manually. Setting blue gain and red gain(0~255).



CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain, 0x00~0xff
CAM_BGain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain, 0x00~0xff

Day & Night Setting

■ Day&Night Mode

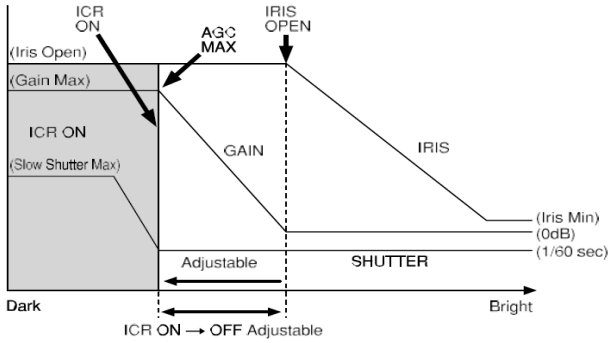
CAM_ICR	8x 01 04 01 0p FF	p=2(ICR ON) p=3(ICR OFF)
CAM_AutoICR	8x 01 04 51 0p FF	p=2(Auto ICR ON) p=3(Auto ICR OFF)

Mode	CAM_AutoICR	CAM_ICR
Day	OFF	OFF
Night	OFF	ON
Auto	ON	Don't care

You can select D & N mode in more detail.

CAM_ICR_Ext	8x 01 04 01 pp FF	pp=02 : ICR ON pp=03 : ICR OFF **pp=20 : Auto** **pp=21 : Day** **pp=22 : Night** **pp=23 : Ext-H** **pp=24 : Ext-L**

● AUTO Mode
If the current illumination is darker than the ICR ON level, the IR cut filter is removed. If it is brighter than the ICR OFF level, the IR cut filter is enabled.
ICR ON level = Day To Night level
ICR OFF level = Night To Day level



CAM_AutoICR_Threshold	8x 01 04 21 00 00 0p 0q FF	pq:ICR ON->OFF threshold level
KT_AutoICR_Threshold	8x 01 04 41 00 00 0p 0q FF	pq:ICR OFF->ON threshold level
KT_DwellTime	8x 01 04 41 01 00 0p 0q FF	pq:1~60 seconds

● DAY Mode (=ICR OFF fixed)
It always maintains the DAY (color) state regardless of the current illumination.

● NIGHT Mode (=ICR ON fixed)
It always maintains the NIGHT (B/W) state regardless of the current illumination.

●EXT-L/H Mode
DAY / NIGHT is determined according to the external input signal.
In EXT-H mode, when the input signal level is greater than DAY TO NIGHT LEVEL, it switches to NIGHT.
In EXT-L mode, if the input signal level is lower than DAY TO NIGHT LEVEL, it switches to NIGHT.

KT_ExtICRthreshold	Day->Night(EXT-H)	8x 01 70 05 10 0p 0q FF
	Night->Day(EXT-H)	8x 01 70 05 11 0p 0q FF
	Day->Night(EXT-L)	8x 01 70 05 20 0p 0q FF
	Night->Day(EXT-L)	8x 01 70 05 21 0p 0q FF

■ CVBS Color Burst
Set color burst on / off of CVBS output signal.
However, it is applicable only at night.

KT_CvbsColorBurst	8x 01 70 13 0p FF	p=2 (color burst on at night) 3(color burst off at night)

■ Dwell Time
Set the day / night switching time. It is used for day/night switching in D & N Auto / ext-H / ext-L mode.

KT_DwellTime	8x 01 04 41 01 00 0p 0q FF	pq:1~60 seconds

■ Night color
In night mode, color images can be viewed instead of black and white images.

KT_NightColr	8x 01 70 A2 0p FF	p=0 : BW image @ night p=1 : Color image @ night

Noise Reduction

• 3D-NR, 2D-NR, 3D+2D NR

CAM_NR	8x 01 04 53 0p FF	p=0(off), level 1~5 (2D+3D) p=6 : 2D+3DNR auto mode
KT_DnrMode	8x 01 70 36 0p FF	p : DNR mode 0(Off)/1(2D)/2(3D)/3(2D+3D)
KT_DnrLevel	8x 01 70 39 0p 0q FF	p : DNR level 0(auto) 1(low)~3(high) q : DNR aperture 0~4

• DNR aperture
0 : least aperture : most motion artifact
1 : less aperture : more motion artifact
2 : Normal aperture : normal motion artifact
3 : more aperture : less motion artifact
4 : most aperture : least motion artifact

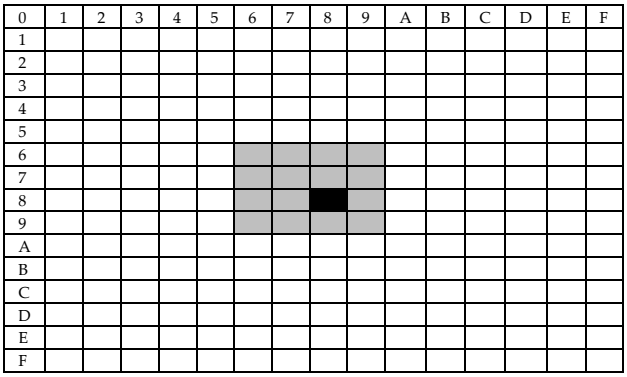
Defog

- Sharpens cloudy images such as fog.

CAM_Defog	8x 01 04 37 0p 00 FF	p=2(ON) / 3(OFF) / 4(AUTO)
KT_DefogOnLevel	8x 01 70 3C 0p 00 FF	p=0~16 (defog ON mode level)
KT_DefogAutoLevel	8x 01 70 3D 0p 0q FF	p=0~2 (defog Auto mode level) q=0~3(defog Auto mode threshold)

Spot AE

- Available in Full Auto AE mode.
- A particular section of the subject can be designated, and then that portion of the image can be weighted and a value computed so that iris and gain can be optimized to obtain an image.



CAM_SpotAE	On	8x 01 04 59 02 FF	Spot AE mode
	Off	8x 01 04 59 03 FF	
	Position	8x 01 04 29 0p 0q 0r 0s FF	pq:X(0~F), rs:Y(0~F)

Slow AE Response

The Slow AE Response function allows you to reduce the exposure response speed. (example) If the headlights of a car are caught by the camera, the camera automatically adjusts the exposure so that it can shoot a high-intensity subject. Since AE responds slowly, it can be prevent images from being shot.

CAM_AE_Response	8x 01 04 5D pp FF	pp: 01 to 30 default 01

Digital Image Stabilizer (DIS)

- This function reduces image blurring caused by vibration

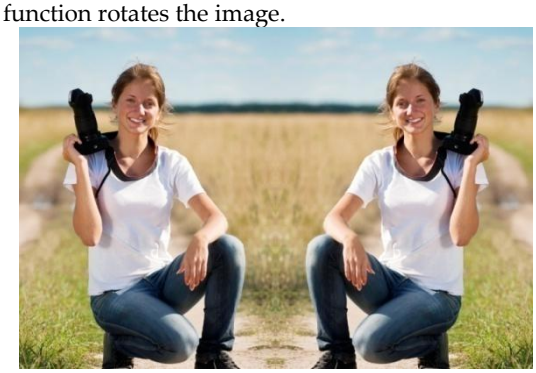

(before)


(after)

CAM_Stablizer	8x 01 04 34 0p FF	p=2 (ON), 3(OFF)

Image Mirror

This function rotates the image.



(off) (H-flip)

(V-flip) (H/V-flip)

CAM_PictureFlip (180^{O} rotation)	8x 01 04 66 0p FF	p=2(ON) 3(OFF)
CAM_LR_Reverse	8x 01 04 61 0p FF	p=2(ON) 3(OFF)

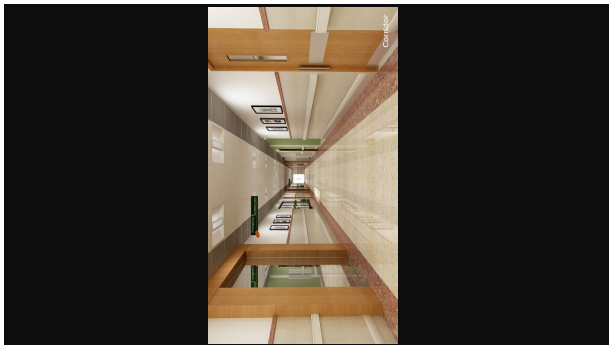
Mirror Mode	CAM_PictureFlip	CAM_LR_Reverse
Off	OFF	OFF
H-flip	OFF	ON
V-flip	ON	ON
H/V-flip	ON	OFF

KT_ImageRotate (corridor & mirror)	8x 01 70 4A 0p 0q FF	p=corridor mode 0(Off) 1(Full) 2(Crop) q=mirror mode 0(Off) 1(H-flip) 2(V-flip) 3(HV-flip)

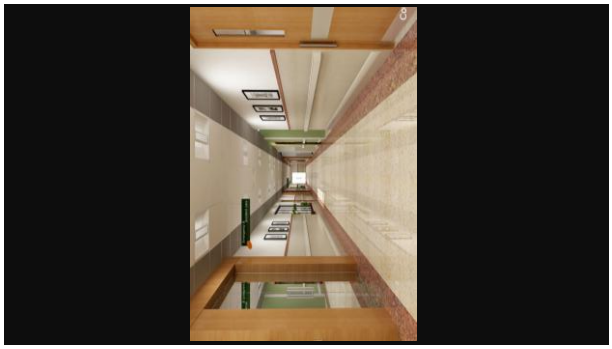
Corridor View

In many surveillance situations you want to monitor an area that is more vertical than horizontal in shape. This includes staircases, hallways, aisles, roads, runways, tunnels, and many other applications. In these situations, the traditional landscape format is not the optimal solution since it creates video streams where a large part of the field of view – specifically the sides of the image – is redundant.

(Original Image)



(Corridor Full mode)
The original picture is output.



(Corridor Crop mode)
Corridor Crop mode is also known as 1: 1 mode.
The original picture may not be output at all.

Freeze

This function captures an image in the field memory of the camera so that this image can be output continuously.

CAM_Freeze	On	8x 01 04 62 02 FF	Still Image ON/OFF
	Off	8x 01 04 62 03 FF	

Memory Preset

16 sets of camera shooting conditions can be stored and recalled.

- Zoom Position
- Digital Zoom Mode
- Focus Mode
- AE mode
- Shutter control parameters
- Bright , Iris, Gain
- Exposure Compensation mode
- Exposure Level
- Backlight Compensation mode
- Auto Slow Shutter On/Off
- White Balance mode
- Red/Blue Gain
- Aperture Control
- ICR mode, Defog, WDR mode

CAM_Memory	Reset	8x 01 04 3F 00 0p FF	p:Memory Number(0~F)
	Set	8x 01 04 3F 01 0p FF	
	Recall	8x 01 04 3F 02 0p FF	

(See. Custom/Memory Preset Setting Items)

Custom Preset

As with the memory preset function, the camera shooting conditions can be saved and recalled. The settings are recalled when the power is turned on.

- The above memory preset contents
- Privacy mask, Motion detect , Title
- Flip, mirror, negative, BW, Gamma, DNR, DIS, AF controls, camera ID, HLC, ETC.

CAM_Custom	Reset	8x 01 04 3F 00 7F FF	Starts up in this mode when the power is turned on
	Set	8x 01 04 3F 01 7F FF	
	Recall	8x 01 04 3F 02 7F FF	
	Inactive	8x 01 04 3F 10 7F FF	
	Active	8x 01 04 3F 11 7F FF	

(See. Custom/Memory Preset Setting Items)

(NOTE)
You can decide whether to use a custom preset.
When the product is shipped, custom preset is disabled(inactive mode)

*To enable the custom preset, the user must send **SET/RECALL or ACTIVE** command.*
*To disable the custom preset, send **INACTIVE** command.*

<Custom Preset Mode>
When the power is turned on,
*- **Active** : starts up in the custom preset settings*
*- **Inactive** : starts up in the settings before the power is turned off*
(factory shipment default : Inactive mode)

User Memory Area

You can use up to 16 bytes to store data such as camera number.

Position Preset

The current zoom / focus position can be stored in the internal memory and moved to that position if necessary. A total of 256 locations can be stored.

KT_ZoomFocus Preset	Set	8x 01 70 3F 01 0p 0q 0r FF	pqr : preset Number (0x000~0x0FF)
	Recall	8x 01 70 3F 02 0p 0q 0r FF	
	Clear	8x 01 70 3F 03 0p 0q 0r FF	
	Clear All Preset	8x 01 70 3F 0F 00 00 00 FF	Clear all preset data
KT_ZoomFocus PresetInq	8x 09 703F 0n 0n 0n FF	y0 50 0v 0z 0z 0z 0z 0f 0f 0f 0f FF	nnn:preset number (0x000~0x0FF) v : 1(saved), 0(empty) zzzz : zoom position ffff : focus position

Motion Detect Function

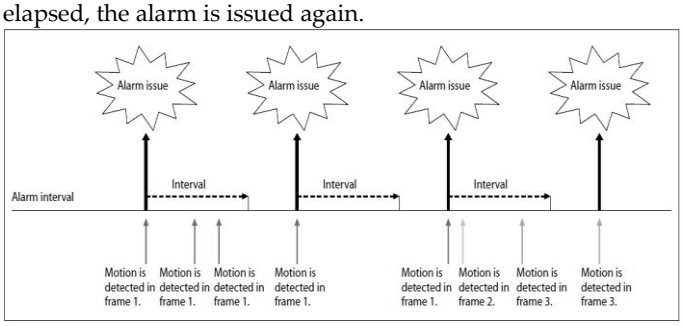
Motion Detect functions instructs the camera to detect movement within monitoring area and then send an alarm signal automatically.

◇ Frame

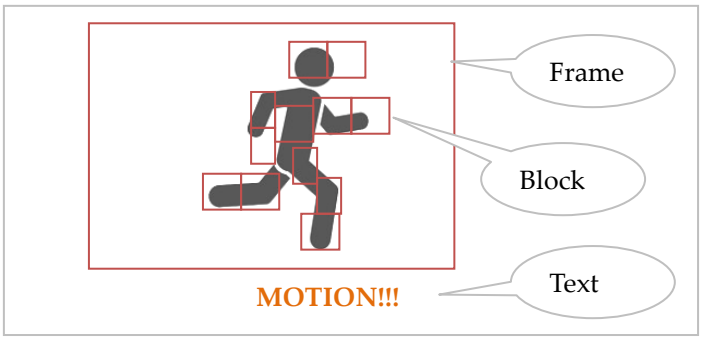
You can set up to 4-frames
Each frame can be set up :
Using VISCA : 16 (horizontally)×8 (vertically) blocks
Using MENU : 60 (horizontally)×34 (vertically) blocks

◇ Sending Alarms

• When motion is detected, the Alarm Replay command is issued via the serial command (VISCA) communication line.
• When multiple motions are detected or motion is detected in another frame within the set interval following the original time the alarm was issued, another alarm command is not issued.
• When motion is detected after the interval time elapsed, the alarm is issued again.



On	8x 01 04 1B 02 FF	Motion Detection On/Off
Off	8x 01 04 1B 03 FF	
Function Set	8x 01 04 1C 0m 0n 0p 0q 0r 0s FF	m: Display mode (when motion is detected) bit0 : frame display bit1 : block display bit2 : Text display n: Detection Frame Set (0 to F) bit0(frame1)~bit3(frame4) pq: Threshold Level (00 to FF) rs: Interval Time set (00 to FF)
Window Set	8x 01 04 1D 0m 0p 0q rr 0s FF	m: Select Detection Frame (0, 1, 2, 3) p: Start Horizontal Position (00 to 0F) q: Start Vertical Position (00 to 07) r: Stop Horizontal Position (01 to 10) s: Stop Vertical Position (01 to 08)
Alarm (Reply)	y0 07 04 1B 0p FF	p: Detection Frame Number



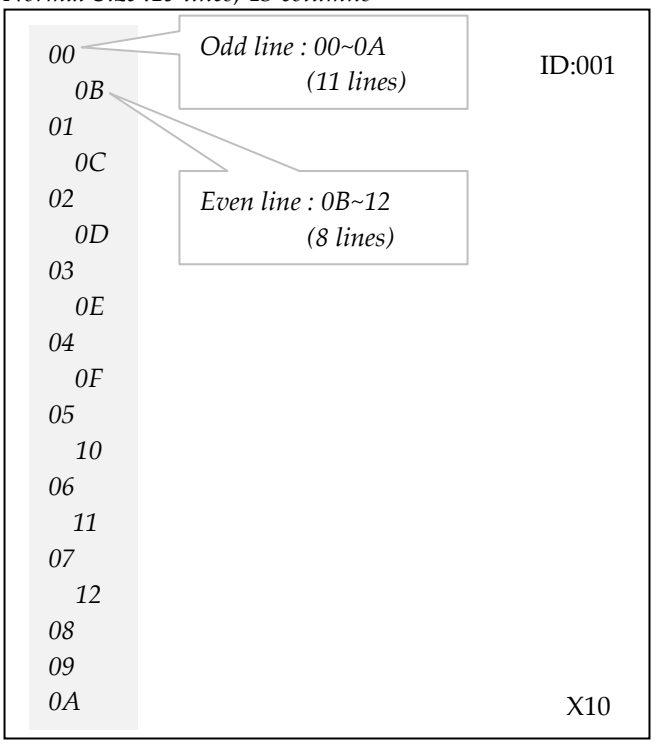
(*) Blocks are output only within the Frame area.

Title / Function Display

The user can output desired characters on the screen and can also choose the output font size.

See."CAM_Title", "CAM_ MultiLineTitle", "CAM_EvenLeneTitle"

Normal Size :19 lines, 43 columns



System Reset

Initialize most camera states.
Several important values are not initialized. (ex. Framerate, Baudrate, Trigger, LVDS mode, CVBS Aspect, Color Adjust Data, Picture Style, etc.)

KT_FactoryDefault	8x 01 70 EE EE FF

Initializes the entire system to the factory default.
All values are initialized.
Be careful(!!!)

KT_FactoryDefSystem	8x 01 70 EF EF FF

Privacy Zone Masking

Privacy Zone masking protects private objects and areas such as house windows, entrances, and exits which are within the camera's range of vision but not subject to surveillance. Privacy zone masking can be masked on the monitor to protect privacy.

- Mask can be set on up to 8 places according to Pan/ Tilt positions.
- Interlocking control with zooming.
- Interlocking control with Pan/Tilt.
- Non-interlocking control with Pan/Tilt.

Command Set	Command	Command	Comments
CAM_PrivacyZone	SetMask	8x 01 04 76 mm nn 0r 0r 0s 0s FF	Setting Mask(Size) See "mm: Mask setting list", "nn: Setting", and"rr: w, ss: h" in"Parameters"
	Display	8x 01 04 77 pp pp pp pp FF	Setting Mask Display On/Off See "pp pp pp pp: Mask bit" in"Parameters" . pp pp pp pp: Mask setting (0: OFF, 1: ON)
	SetMaskColor	8x 01 04 78 pp pp pp pp qq rr FF	Setting Color of Mask See "pp pp pp pp: Mask bit" and"qq, rr: Color code" in"Parameters". qq: Color setting when setting the Mask bit to 0 rr: Color setting when setting the Mask
	SetPanTiltAngle	8x 01 04 79 0p 0p 0p 0q 0q 0q FF	Setting Pan/Tilt Angle See "Setting pan/tilt angle" in"Parameters". ppp: Pan angle, qqq: Tilt angle
	SetPTZMask	8x 01 04 7B mm 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	Setting the direct position of PTZ See "mm: Mask setting list" and"Setting pan/tilt angle" in"Parameters". ppp: Pan , qqq: Tilt , rrrr: Zoom
	Non_InterlockMask	8x 01 04 6F mm 0p 0p 0q 0q 0r 0r 0s 0s FF	Setting non-interlocking the mask to pan/till See "mm: Mack setting list" and"pp:x,qq:y, rr:w, ss:

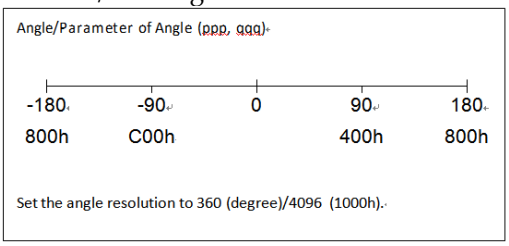
Inquiry Command	Command Packet	Inquiry Packet	Comments
CAM_Privacy DisplayInq	8x 09 04 77 FF	y0 50 pp pp pp pp FF	Inquiry about the status of Setting Mask Display On/ Off See "pp pp pp pp: Mask bit" in"Parameters" . 1:On, 0:Off
CAM_PrivacyPan TiltInq	8x 09 04 79 FF	y0 50 0p 0p 0p 0q 0q 0q FF	Inquiry about the pan/tilt position currently set See "Setting pan/tilt angle" in"Parameters". ppp: Pan, qqq: Tilt
CAM_PrivacyPTZI nq	8x 09 04 7B mm FF	y0 50 0p 0p 0p 0q 0q 0q 0r 0r 0r 0r FF	Inquiry about pan/tilt/zoom position at the mm Mask setting See "mm: Mask setting list" and"Setting pan/tilt angle" in"Parameters". ppp: Pan osition, qqq: Tilt Position rrrr: Zoom
CAM_Privacy MonitorInq	8x 09 04 6F FF	y0 50 pp pp pp pp FF	Inquiry about the mask currently displayed See "pp pp pp pp: Mask bit" in"Parameters".

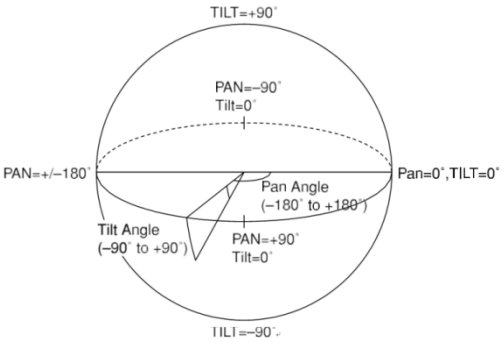
- Mask Number : A=0x00, B=0x01,…W=0x16, X=0x17 (total 24 masks)
- Mask Bit & Mask List(mm)

	pp pp pp pp (mask bit) or mm(Mask list)																													
byte	pp								pp								pp								pp					
bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Mask	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	H	G	-	-	F	E	D	C	B	A
List(mm)																							07	06			05	04	03	02	01	00

The priority order of the mask display is in the sequence from A (highest) to P (lowest).

- Pan/Tilt Angle





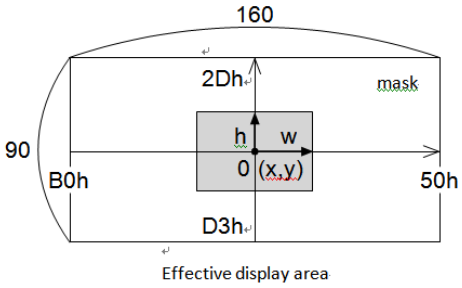
✓ *You can use the tilt angle at which you can set the mask between -90 to + 90 degrees. But the recommended tilt angle is between –70 to +70 degrees.*

✓ *It is recommended that you set the size to at least twice the size of the object (height and width).*

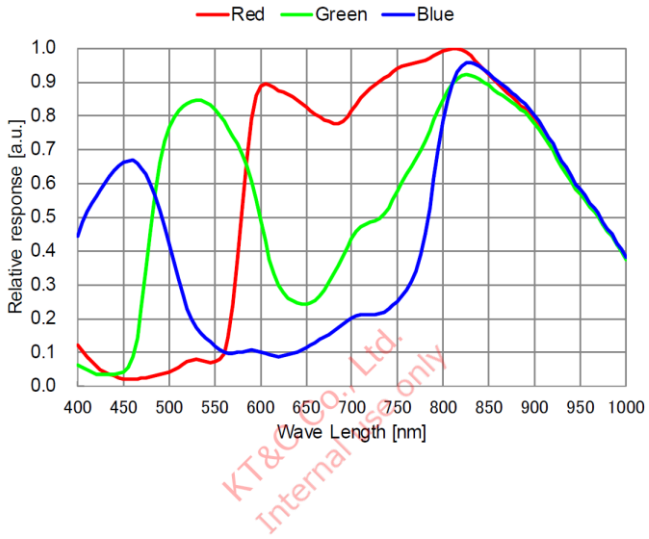
- Mask Color (qq, rr)

Mask (Color)	Normal	Translucence
Black	00h	10h
Gray1	01h	11h
Gray2	02h	12h
Gray3	03h	13h
Gray4	04h	14h
Gray5	05h	15h
Gray6	06h	16h
White	07h	17h
Red	08h	18h
Green	09h	19h
Blue	0Ah	1Ah
Cyan	0Bh	1Bh
Yellow	0Ch	1Ch
Magenta	0Dh	1Dh

- Mask Size : Width/Height



Spectral Sensitivity Characteristics



Use the graph as a reference value. We can not guarantee these values.