CCD COLOR CAMERA CCU

CSU9002/CSU9002P

Specifications

Contents

TOSHIBA TELI CORPORATION

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CASES FOR INDEMNITY (LIMITED WARRANTY)

We shall be exempted from taking responsibility and held harmless for damage or losses incurred by the user in the following cases.

- In the case damage or losses are caused by fire, earthquake, or other acts of God, acts by a third party, deliberate or accidental misuse by the user, or use under extreme operating conditions.
- In the case of indirect, additional, consequential damages (loss of business interests, suspension of business activities) are incurred as result of malfunction or non-function of the equipment, we shall be exempted from responsibility for such damages.
- In the case damage or losses are caused by failure to observe the information contained in the instructions in this instruction manual and specifications.
- In the case damage or losses are caused by use contrary to the instructions in this instruction manual and specifications.
- In the case damage or losses are caused by malfunction or other problems resulting from use of equipment or software that is not specified.
- In the case damage or losses are caused by repair or modification conducted by the customer or any unauthorized third party (such as an unauthorized service representative).
- Expenses we bear on this product shall be limited to the individual price of the product.

RESTRICTION FOR USE

- Should the equipment be used in the following conditions or environments, give consideration to safety measures and inform us of such usage:
  1. Use of the equipment in the conditions or environment contrary to those specified, or use outdoors.
  2. Use of the equipment in applications expected to cause potential hazard to people or property, which require special safety measures to be adopted.
- This product can be used under diverse operating conditions. Determination of applicability of equipment or devices concerned shall be determined after analysis or testing as necessary by the designer of such equipment or devices, or personnel related to the specifications. Such designer or personnel shall assure the performance and safety of the equipment or devices.
- This product is not designed or manufactured to be used for control of equipment directly concerned with human life (*1) or equipment relating to maintenance of public services/functions involving factors of safety (*2). Therefore, the product shall not be used for such applications.

  (*1): Equipment directly concerned with human life refers to.
  - Exhaust control equipment for exhaust gases such as toxic fumes or smoke.
  - Equipment mandatory to be installed by various laws and regulations such as the Fire Act or Building Standard Law
  - Equipment related to the above

  (*2): Equipment relating to maintenance of public services/functions involving factors of safety refers to.
  - Traffic control systems for air transportation, railways, roads, or marine transportation
  - Equipment for nuclear power generation
  - Equipment related to the above

1. Introduction

The CSU9002/CSU9002P is CCU for a separate-camera head type CCD color camera, and with an open-frame body & compatible to universality size CCD.

2. Features

(1) DC12 V Drive

Power voltage of this product is DC12 V suitable for assembly within a device.

(2) Universal camera head

1/2, 1/3, 1/4, 1/6(400,000 pixels), 1/10(250,000 pixels) types CCD, NTSC(CSU9002) , and the camera head of PAL(CSU9002P) can be connected.

(3) Analog image output

VBS output 2ch and Y/C 1ch each Possible.

(4) Digital image output

It is Y and U/V 8bit (4:2:2) digital image output.

(5) Control Board

It can be operated various functions by outside Control Board.

(6) Functions

- Auto White balance (one push)
- Brightness (controlled by ALC level)
- OSD Information

3. Configuration

(1) Main Board	1
(2) Connected cable	
Power input (380mm)	1
Camera (Three kinds) (380mm)	1
Control (Two kinds) (380mm)	1
Analog image output (380mm)	1
Digital image output (380mm)	1
(3) Package	1

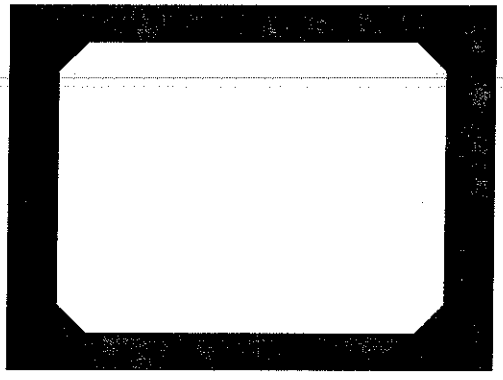
4. Specifications

4-1 Electric specification

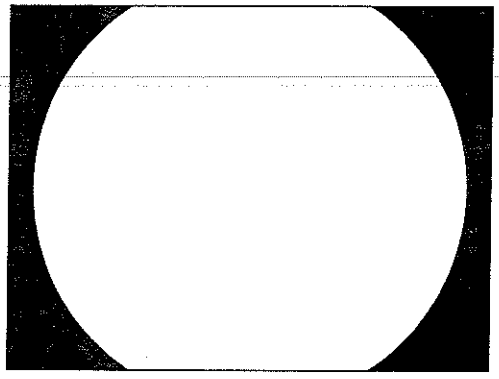
No.	Item	CSU9002	CSU9002P
1	Image sensor (1/2 type)	ICX428AK-7 (SONY)	ICX429AK-7 (SONY)
	Total pixels	811 (H) × 508 (V)	795 (H) × 596 (V)
	Active pixels	768 (H) × 494 (V)	752 (H) × 582 (V)
	Optical size	Diagonal 8mm (1/2 type)	
	Chip size	7.4mm (H) × 5.95mm (V)	
	Unit cell size	8.4μm (H) × 9.8μm (V)	8.6μm (H) × 8.3μm (V)
	Image sensor (1/3 type)	ICX408AKB(SONY)	ICX409AKB(SONY)
	Total pixels	811 (H) × 508 (V)	795 (H) × 596 (V)
	Active pixels	768 (H) × 494 (V)	752 (H) × 582 (V)
	Optical size	Diagonal 6mm (1/3 type)	
	Chip size	5.59mm (H) × 4.68mm (V)	
	Unit cell size	6.35μm (H) × 7.40μm (V)	6.50μm (H) × 6.25μm (V)
	Image sensor (1/4 type)	ICX228AKB(SONY)	ICX229AKB(SONY)
	Total pixels	811 (H) × 508 (V)	795 (H) × 596 (V)
	Active pixels	768 (H) × 494 (V)	752 (H) × 582 (V)
	Optical size	Diagonal 4.5mm (1/4 type)	
	Chip size	4.34mm (H) × 3.69mm (V)	
	Unit cell size	4.75μm (H) × 5.55μm (V)	4.85μm (H) × 4.65μm (V)
	Image sensor (1/6 type)	ICX238AKC(SONY)	ICX239AKC(SONY)
	Total pixels	811 (H) × 508 (V)	795 (H) × 596 (V)
	Active pixels	768 (H) × 494 (V)	752 (H) × 582 (V)
	Optical size	Diagonal 3mm (1/6 type)	
	Chip size	3.30mm (H) × 2.95mm (V)	
	Unit cell size	3.200μm (H) × 3.725μm (V)	3.275μm (H) × 3.250μm (V)
	Image sensor (1/10 type)	ICX256FKW(SONY)	ICX257FKW(SONY)
	Total pixels	537 (H) × 505 (V)	537 (H) × 597 (V)
	Active pixels	510 (H) × 492 (V)	500 (H) × 582 (V)
	Optical size	Diagonal 1.8mm (1/10 type)	
	Chip size	2.00mm (H) × 2.00mm (V)	
	Unit cell size	2.90μm (H) × 2.25μm (V)	2.95μm (H) × 1.90μm (V)
	Color filter	Complementary color mosaic filter (Ye, Cy, Mg, G)	
	Integration method	Field period readout	
2	TV system	NTSC	PAL
3	Scanning lines	525 lines	625 lines
4	Scanning system	2:1 interlace	
5	Sync system	Internal synchronization	
6	Aspect ratio	4:3	
7	Analog output		
	VBS ×2	1.0 V(p-p)/75Ω Positive polarity	
	Y/C ×1 VS	1.0 V(p-p)/75Ω Positive polarity	
	C	0.286V(p-p)/75Ω	0.3V(p-p)/75Ω
8	Digital output		
	Format	Y:U:V=4:2:2 Digital 8bit parallel output	
	Signal level	3.3V CMOS logic level	

No.	Item	CSU9002	CSU9002P
9	Resolution		
	Horizontal resolution (1/2,1/3,1/4,1/6 type)	460 TV lines	460 TV lines
	Horizontal resolution (1/10 type)	330 TV lines	320 TV lines
	Vertical resolution	350 TV lines	420 TV lines
10	Digitizing method	10bit linear Quantization	
11	S/N	46dB(p-p)/rms typical	
12	Sensitivity	F5.6, 3000K	
	1/2 type	350 lx	
	1/3 type	475 lx	
	1/4 type	1,000 lx	
	1/6 type	1,500 lx	
	1/10 type	2,000 lx	
13	Minimum subject illumination	F1.4, 3000K,GAIN +12dB, Output level: Approx. 50%	
	1/2 type	3 lx	
	1/3 type	5 lx	
	1/4 type	8 lx	
	1/6 type	12 lx	
	1/10 type	16 lx	
14	ALC (Automatic Light Control)	ON/OFF switch-able (S16/S15) Corrective range: From -6dB through +60dB Detection area: Screen center Detection format: Average/Peak switch-able (S9)	
15	Brightness	12step selectable (S2/S3)	
16	Enhance	3step selectable (S1)	
17	White balance	One-push auto white balance switch-able (S8) Corrective range: From 2800K through 6500K Auto white balance detection area: Whole screen Adjust R gain:18step (S4/S5) Adjust B gain:18step (S6/S7)	
18	Blood emphasis	ON/OFF switch-able (S10)	
19	Masking *Figure 1	ON/OFF switch-able (S14) Octagon/Circle switch-able (S13)	
20	Save	Switch setting can be saved.	
21	Power source	DC12V±1V (Ripple voltage : 50mV(p-p) or less)	
22	Current consumption	Approx. 400mA	

Figure 1 : Masking



Octagon



Circle

4-2 Synchronous specification

No.	Item	CSU9002	CSU9002P
1	Standard clock frequency		
	1/2,1/3,1/4,1/6 type	14.31818MHz	14.18750MHz
	1/10 type	9.53496MHz	9.46875MHz
2	Horizontal frequency	15.734kHz	15.625kHz
3	Vertical frequency	59.94Hz	50Hz

4-3 Machine outside specification

No.	Item	CSU9002	CSU9002P
1	Camera cable	3.5m(2mm Diameter)	
2	External dimension	Approx.130mm×100mm	

4-4 Use environmental conditions

No.	Item	CSU9002	CSU9002P
1	Guarantee temperature of operation	From 0 through 40 degrees	
2	Guarantee humidity of operation	From 30 through 85%Rh (No condensation)	
3	Guarantee atmospheric pressure of Operation	From 500 through 1060hPa	

4-5 Connector Pin Assignment

(1) J1 Power Connector: 00-8283-0312-00-000+(KYOCERA ELCO)

Pin No.	Signal Name	Description
1	+12V	DC+12V IN
2	N.C.	Unassigned
3	GND	GND

Compatible plug: 60-8283-3038-45-000(KYOCERA ELCO)

Compatible contact: 60-8283-0513-99-808(KYOCERA ELCO)

*Refer to Section 4-3 Specification Table, Power Source, below for power IN parameter.

(2) J2 OS Connector: 53398-0271 (MOLEX)

Pin No.	Signal Name	Description
1	OS	OS IN
2	OS GND	OS GND

Compatible Plug: 51021-0200(MOLEX)

Compatible Contact: 50058-8000(MOLEX)

(3) J3 CCD H Drive Pulse Connector: 53398-0671 (MOLEX)

Pin No.	Signal Name	Description
1	RG	CCD reset pulse
2	RG GND	GND for RG
3	H1	CCD horizontal drive pulse 1
4	H GND	GND for H1
5	H2	CCD horizontal drive pulse 2
6	H GND	GND for H2

Compatible Plug: 51061-0600(MOLEX)

Compatible Contact: 50058-8000(MOLEX)

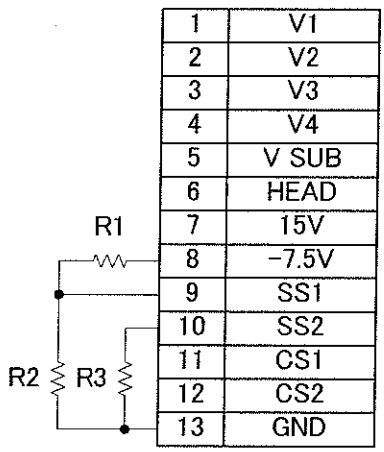
(4) J4 CCD Drive Pulse Connector: 53398-1371 (MOLEX)

Pin No.	Signal Name	Description
1	V1	CCD vertical drive pulse 1
2	V2	CCD vertical drive pulse 2
3	V3	CCD vertical drive pulse 3
4	V4	CCD vertical drive pulse 4
5	V SUB	CCD drive pulse
6	HEAD	Camera head detection
7	+12V/+15V	DC+12V/+15V output
8	-5V/-7.5V/-9V	DC-5V/-7.5V/-9V output
9	SS1	Sensor select signal 1
10	SS2	Sensor select signal 2
11	CABLE SEL1	Cable select signal 1
12	CABLE SEL2	Cable select signal 2
13	GND	GND

Compatible Plug: 51021-1300(MOLEX)
Compatible Contact: 50058-8000(MOLEX)

①SENSOR SELECT

TYPE	R1	R2	R3
1/2	220k	OPEN	OPEN
1/3	330k	OPEN	OPEN
1/4	OPEN	0	OPEN
1/6	OPEN	OPEN	OPEN
1/10	OPEN	OPEN	0



②CABLE SELECT

TYPE	J4-11	J4-12	CABLE
	CS1	CS2	LENGTH
ALL	OPEN	OPEN	3.0m
	GND	OPEN	3.5m
	OPEN	GND	4.0m
	GND	GND	4.5m

(5) J5 Control Board Connector: 53398-1571 (MOLEX)

Pin No.	Signal Name	Description
1	SW1	Switch terminal 1
2	SW2	Switch terminal 2
3	SW3	Switch terminal 3
4	SW4	Switch terminal 4
5	SWA	Switch terminal A
6	SWB	Switch terminal B
7	SWC	Switch terminal C
8	SWD	Switch terminal D
9	LED1	LED control 1
10	LED2	LED control 2
11	LED3	LED control 3
12	LED4	LED control 4
13	LED5	LED control 5
14	LED6	LED control 6
15	GND	GND

Compatible Plug: 51061-1500(MOLEX)
Compatible Contact: 50058-8000(MOLEX)

(6) J6 Control Board Power Connector: 53398-0271 (MOLEX)

Pin No.	Signal Name	Description
1	+3.3V	+3.3V output
2	GND	GND

Compatible Plug: 51021-0200(MOLEX)
Compatible Contact: 50058-8000(MOLEX)

(7) J7 Digital Output Connector: DF20G-30DP-1V (56) (HIROSE ELCTRIC)

Description	Signal Name	No.	No.	Signal Name	Description
Y output 0 bit	Y0	1	2	UV0	UV output 0 bit
Y output 1 bit	Y1	3	4	UV1	UV output 1 bit
Y output 2 bit	Y2	5	6	UV2	UV output 2 bit
Y output 3 bit	Y3	7	8	UV3	UV output 3 bit
Y output 4 bit	Y4	9	10	UV4	UV output 4 bit
Y output 5 bit	Y5	11	12	UV5	UV output 5 bit
Y output 6 bit	Y6	13	14	UV6	UV output 6 bit
Y output 7 bit	Y7	15	16	UV7	UV output 7 bit
GND	GND	17	18	NRB	UV ID signal
GND	GND	19	20	GND	GND
GND	GND	21	22	HD	Horizontal sync signal
GND	GND	23	24	VD	Vertical sync signal
GND	GND	25	26	FLD	Field pulse
13.5MHz output	DCK	27	28	SYNC	Composite sync
GND	GND	29	30	GND	GND

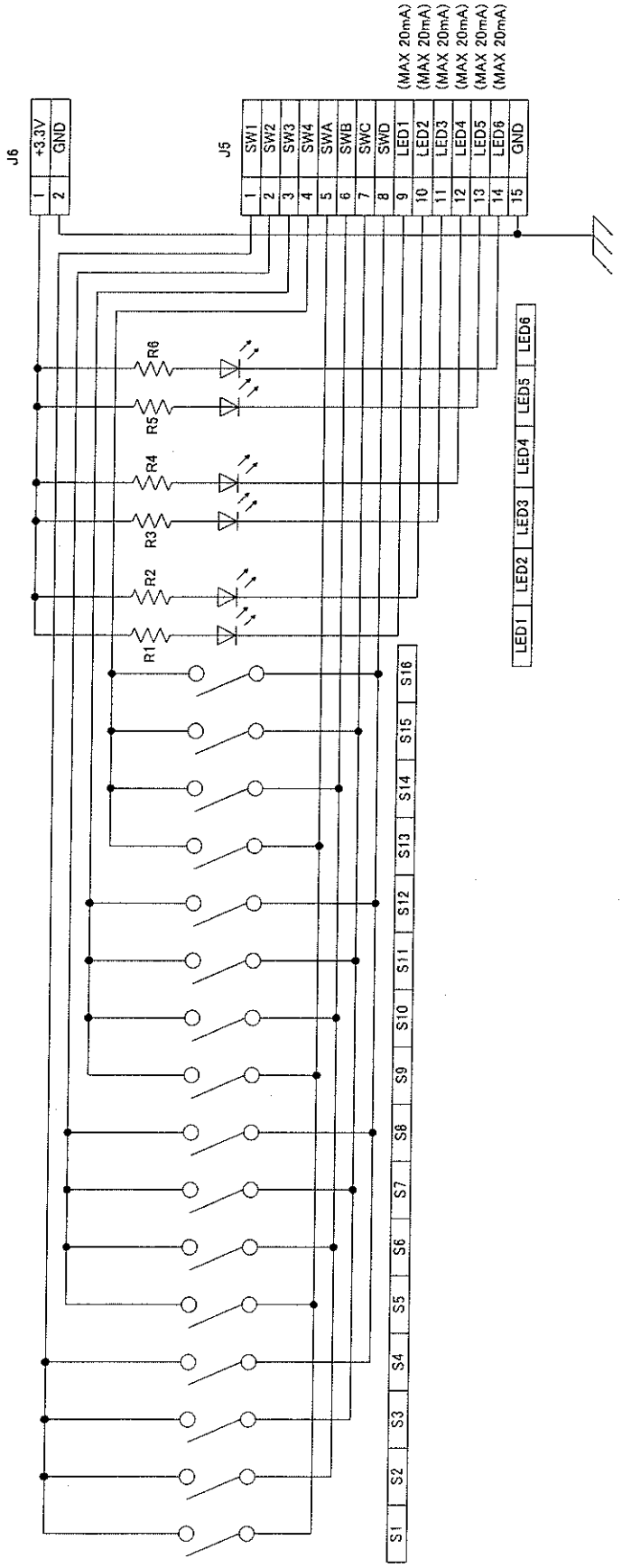
Compatible Plug: DF20A-30DS-1C(HIROSE ELCTRIC)
Compatible Contact: DF20F-3032SCFA(HIROSE ELCTRIC)
*As no buffer is provided on YUV output, a driving error might occur depending on your operation environment. If you plan to use this connector, consult with our staff.

(8) J8 Video Output Connector: 00-8283-0812-00-000+(KYOCERA ELCO)

Pin No.	Signal Name	Description
1	VBS OUT1	VBS output 1
2	VBS GND1	GND for VBS OUT 1
3	VBS OUT2	VBS output 2
4	VBS GND2	GND for VBS OUT 2
5	Y OUT	Y output
6	Y GND	GND for Y OUT
7	C OUT	C output
8	C GND	GND for C OUT

Compatible plug: 60-8283-3088-45-000(KYOCERA ELCO)
Compatible contact: 60-8283-0513-99-808(KYOCERA ELCO)

4-6 External Control Connection Example



S1	ENHANCE (H/M/L)
S2	BRIGHTNESS UP
S3	BRIGHTNESS DOWN
S4	R GAIN UP
S5	R GAIN DOWN
S6	B GAIN UP
S7	B GAIN DOWN
S8	W BALANCE
S9	ALC (Average/Peak)
S10	Blood (ON/OFF)
S11	
S12	
S13	Masking (Octagon/Circle)
S14	Masking (ON/OFF)
S15	ALC ON /OFF
S16	SAVE
LED1	ENHANCE HIGH
LED2	ENHANCE MIDDLE
LED3	ENHANCE LOW
LED4	ALC Peak
LED5	ALC Average
LED6	Blood ON

5. Warranty

(1) Limited warranty

The warranty period will cover the product for one year after its shipment.

(2) Warranty coverage

- If a defect arises and a valid claim is received within the warranty period, TOSHIBA TELI will repair the defect at no charge
- This warranty does not apply ;
  1) to damages caused by misuse and unauthorized repairs and modifications.
  2) to damages caused by the product being dropped, transported, etc.
  3) to damages caused by accident, abuse, flood, fire, earthquake, other external caves, salt damage, gas harm, or abnormal voltage.

6. Repair

(1) Repair method

As a rule, we will replace the breakdown with a new one.

The customers shall bear the cost (business trip expense and technology fee of the camera detaching, etc.).

(2)Repair period covered

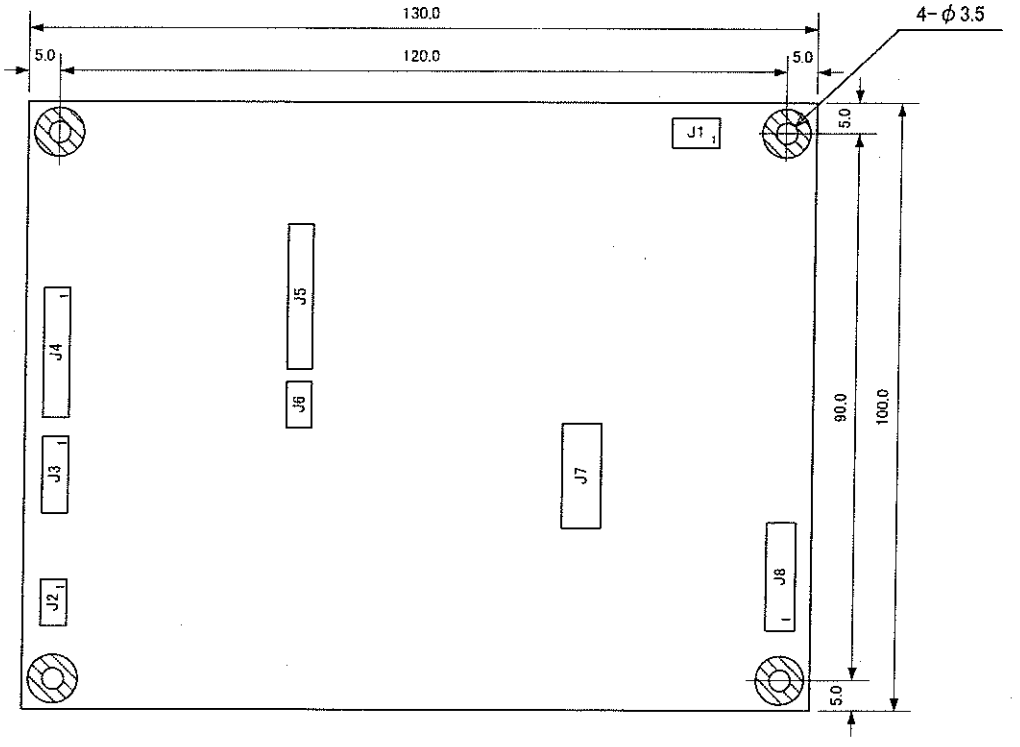
- Free repair

  It depends on clause 5.
- Repair for a fee

  As a rule, we will assume seven years after the final production of products is completed.

7. Attached Drawings

7.1. MAIN BOARD Dimensions



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