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		APPLICABLE DIVISION
		YAO PLANT APPLIANCE SYSTEMS GROUP

SPECIFICATION FOR CCD CAMERA MODULE

Model No.
YH-7C12 ; NTSC

CUSTOMER'S APPROVAL

DATE _____

BY _____

PRESENTED

BY *J. Aoki*

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House Electronics Business Promotion Dept.
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SHARP CORPORATION

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 - Communications equipment for trunk lines
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 - Medical equipment related to life support, etc.
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1. Application

This document describes the specifications of Color CCD Camera to be supplied to _____.

All figures described in this document are based on the conditions that the camera is used under *normal operating temperature, normal operating humidity.

*Normal operating temperature ; +20 ~ +25°C

*Normal operating humidity ; 65 ± 5%RH

The monitor to be used shall be standard monitor.

Model No.	TV system	Output signal	Iris control	Lens
YH-7C12	NTSC	Y/C	EE, 1/100 sec.(fixed)	○

Electronic Exposure (EE)

2. General Description

These color CCD camera modules incorporate 1/4-inch CCD whose characteristics;

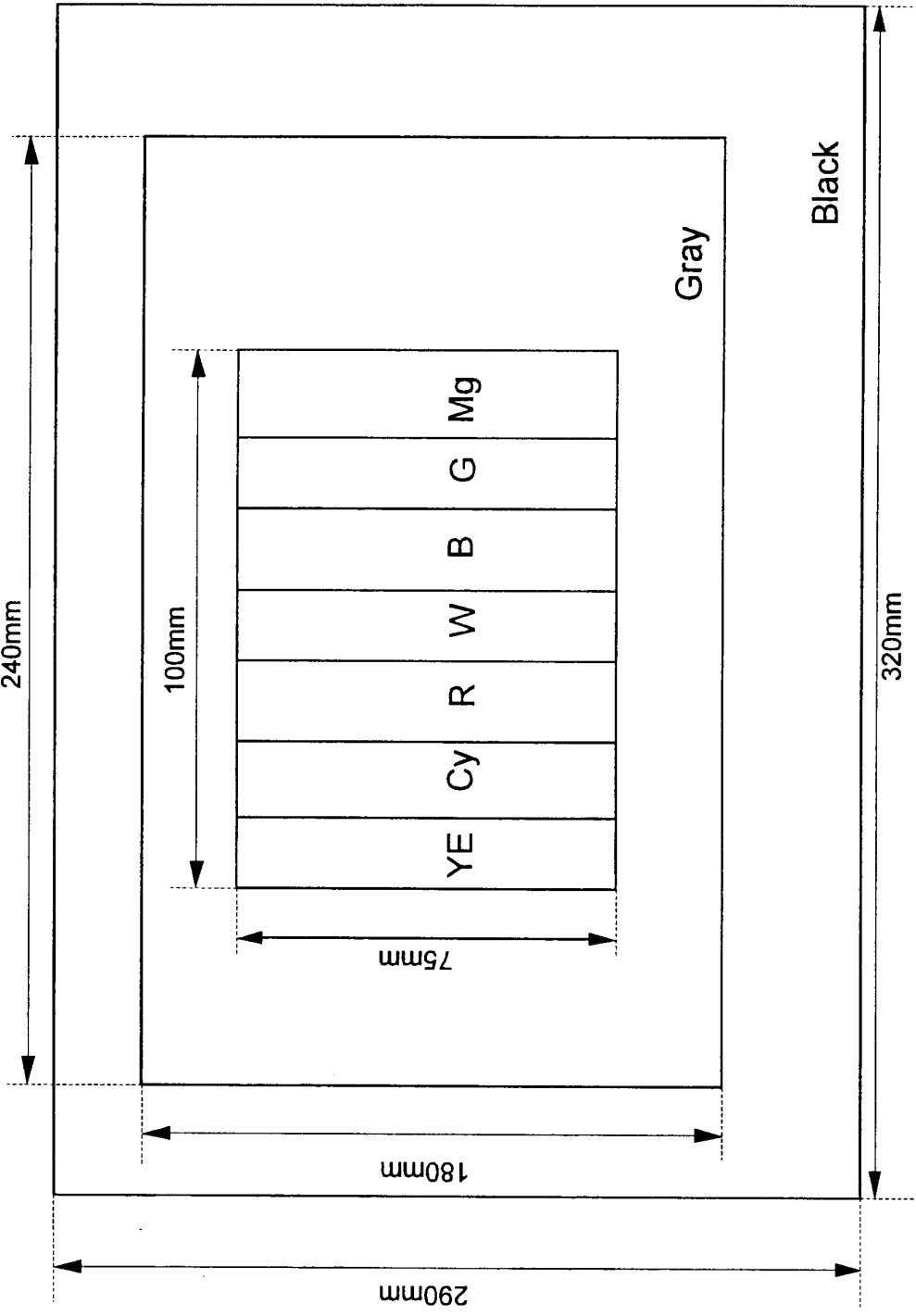
- 1) TV system ; NTSC
- 2) Output signal ; Y/C
- 3) Iris control ; EE type
- 4) White balance
 - Auto ; TTL auto tracing white balance
- 5) Contrast control; Adjustable contrast (up/down), Backlight compensation
 - When power on, contrast level comes to factory preset level.
(NTSC;714mV)
- 6) Built-in compact lens specially designed for the module.
- 7) Connecting cable between CCD board and signal processing board
 - FFC(Flexible Flat Cable)
 - Separable signal processing board and CCD board(up to max.150mm)
- 8) 5V single operation

3. Specifications

TV system	NTSC
Image sensor	1/4" Inter-line transfer CCD
Total pixels	542(H)×492(V)(Total;270K)
Effective pixels	512(H)×492(V)(Total;250K)
Resolution Horizontal Vertical	310 TV lines 280 TV lines
Distance from chart to camera : 70cm	
S/N ratio	≥46dB Condition: AGC off High pass filter 10KHz Fsc trap Weighting filter on Low pass filter(NTSC;4.2MHz) Light shield
Minimum illumination	≤20 lx Condition: ITE gray scale chart(Gamma=1.0) Y signal amplitude 350mV
White balance	TTL auto tracing white balance, Range; 2,800 to 6,800° K
Iris control	EE, 1/100 sec. (fixed)
Gamma correction	approx. 0.6
Auto gain control	Yes Backlight compensation, Switch selectable
Sub-carrier frequency	3.579545MHz ± 200Hz
Sync. system	Internal only
Output video signal	
Y signal	1.0Vp-p/75 Ω
· Y signal amplitude	714mV ± 100mV
· *(Condition 1)	
· Sync. amplitude	286mV ± 80mV
C signal*(Condition 2)	Impedance 75 Ω
R amplitude	88.25 IRE ± 25%
R phase	103.4° ± 15°
B amplitude	62.2 IRE ± 25%
B phase	347.1° ± 15°
· Burst amplitude	286mV ± 90mV
Lens	
focal length	approx. 4.3mm (fixed)
F number	approx. 2.4
viewing angle	
Horizontal	approx. 46°
Vertical	approx. 35°
Focus	manual adjustable (50mm to infinity)
TV distortion	approx. 2%
Power supply	DC 4.5V - DC 7.0V, ≤ 2W
Operating temperature	-10 to +50° C
Storage temperature	-20 to +60° C
Dimension	
CCD board	20(H) × 20(V) × 38(D) mm
Signal processing board	55(H) × 43(V) × 16(D) mm

- *Condition 1: ITE gray scale chart(Gamma=1.0)
- *Condition 2: Exclusive color chart (YH-7C12-01-4)
 - Line select ; 141 lines (NTSC)
 - Y (white) amplitude ; 714mV (NTSC)
 - Color temp ; 5,100°K

Proprietary color chart; Transmissive type
Transmissivity of Gray part; 27%



4.Connector

4-1. CN102(Signal processing board)

- 1) Power input , Signal output , Video signal control
- 2) Pin assignment

No.	Name
1	Video signal level control input (GND)
2	Video signal level up control input
3	Video signal level down control input
4	Y signal
5	C signal
6	GND
7	Power input (Vdd)

3) Connector used in the module Molex 53398 - 0710

4) Mating connector Molex 51021 - 0700

4-2. CN101 (Signal processing board)

- 1) Connection between Signal processing board and CCD board

2) Connector used in the module Molex 52559 - 1690

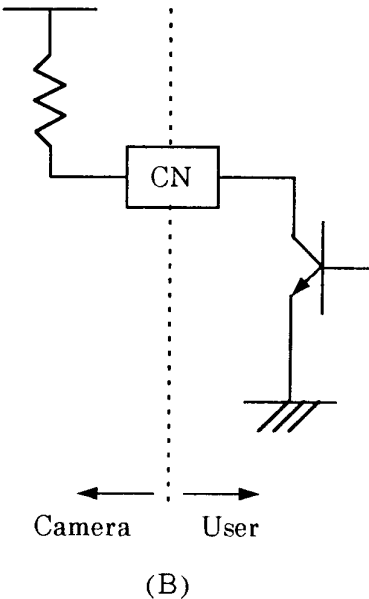
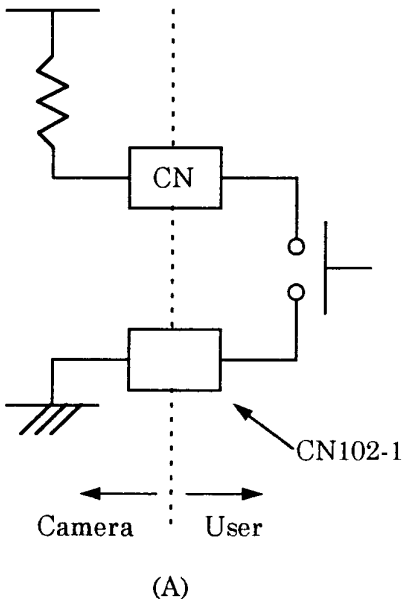
4-3. CN1 (CCD board)

- 1) Connection between Signal processing board and CCD board

2) Connector used in the module Molex 52559 - 1490

5. Video control (CN102)

1) Interface
Either (A) or (B)



2) Input level Hi : more than 4.3V
 Low : less than 0.5V

3) Video signal (contrast) level
When power on , video signal (contrast) level comes to factory preset level.

Pin No.	3	2	Video signal level
Input level	L	L	no change
	L	H	down
	H	L	up
	H	H	no change

6. Reliability Tests

Unless otherwise stated, the following reliability tests are conducted (sampling base) to confirm the reliability of the module in the testing room kept in normal temp. and humidity.

1) Low temp. storage test

To prove that the module shows no abnormal operation and function after it is stored at ambient temp. of -20°C for 24H and then left at room temp. for 2H min.

2) Low temp. operation test

To prove that the module normally operates for continuously 5H at ambient temp. of -10°C .

3) High temp. storage test

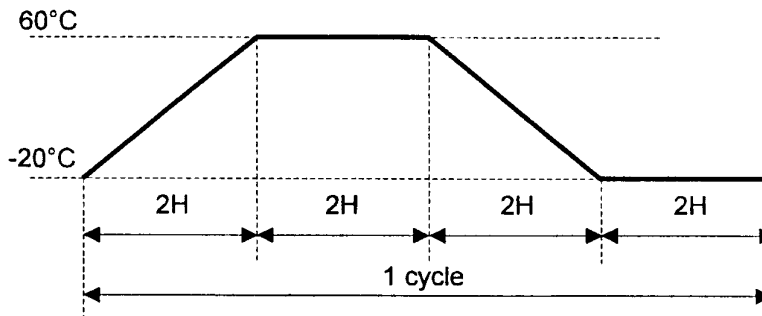
To prove that the module shows no abnormal operation and function after it is stored at ambient temp. of 60°C for 24H and then left at room temp. for 2H min.

4) High temp. operation test

To prove that the module normally operates for continuously 5H at ambient temp. of 50°C .

5) Temp. cycle test

To prove that the module shows no abnormal operation and function during 5 cycles as stipulated in the following pattern and, then 2H storage at room temp.



6) High humidity test

To prove that the module shows no abnormal operation and function after the module has been operated for 24H at ambient temp. of 30°C and relative humidity of 90%RH, and take out from test chamber with water drop removed.

7) Vibration test

To prove that the module shows no abnormal operation and function after vibration test under the condition of $10\sim 55\sim 10\text{Hz/min}$. at acceleration speed 3.6G and up/down for 4H and left/right for 2H and back/forward for 2H.

8) Shock test

Three successive shocks shall be applied in both direction of 3 mutually perpendicular axes (a total of 18 shocks).

Peak acceleration : 50G , Duration of pulse : 10msec

7. Pixel Defect

Number of defective pixels	not more than 10
Condition:	Temperature 25°C Light shield AGC off Standard monitor (NTSC/PAL)

*10 pixels in both horizontal edges and 9 pixels in both vertical edges shall be disregarded as a void area.

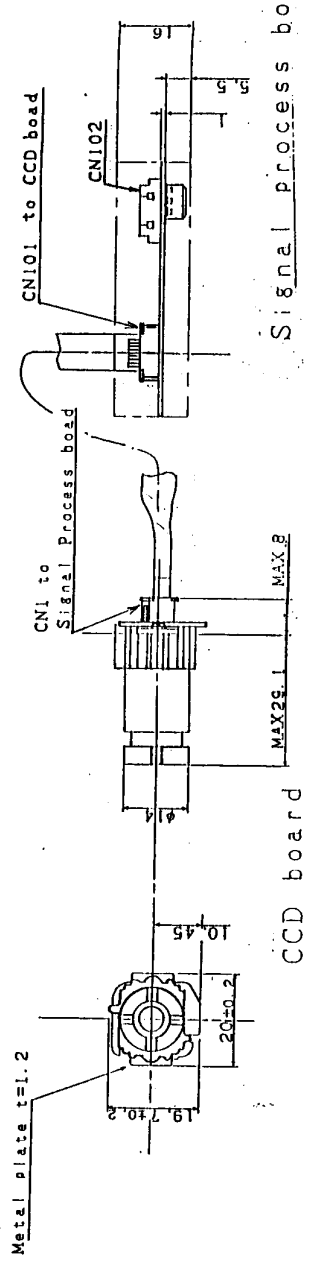
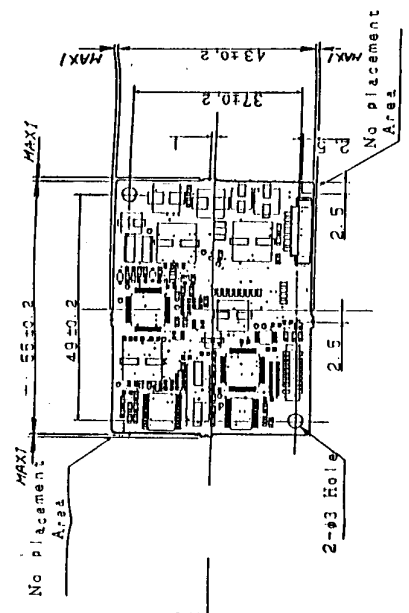
8. Precautions & Notes

- 1) Since EMI is system dependent , agency approval is to be obtained by customer.
- 2) Series regulator is recommended.
In case of using the switching regulator , make sure that regulator does not cause display noise.
- 3) The CCD board and signal processing board contained in each individual carton shall always be used together in the same equipment since the performance of the camera module is factory-tuned on the pair.
- 4) Care shall be used not to damage the components during installation or removal of the cables.
- 5) Never shoot at direct sunlight , since color filters of CCD will be discolored.
The display picture disappears in case of shooting at direct sunlight.
- 6) An earth band or conductive mat shall be used to avoid the generation of static electricity that easily damages the CCD sensors.
- 7) These products are made specifically for indoor use.
(Office and ordinary home-use environment.)

Please note that Sharp cannot guarantee the performance and quality under any use other than the conditions stated above, such as circumstances where vibrations are constant as in a moving vehicle, where shocks may occur as in a moving vehicle or where shocks exceed ordinary house-hold or office use.

品名	YH-7C12-01-9
製造	SHARP
設計	Y. KUMAJI
承認	Y. KUMAJI
工程	YH-7C12-01-9
材料	FR-4
寸法	43±0.2
重量	1.2
備考	

SHARP	19
製造	SHARP
設計	Y. KUMAJI
承認	Y. KUMAJI
工程	YH-7C12-01-9
材料	FR-4
寸法	43±0.2
重量	1.2
備考	



品名	YH-7B Series
製造	SHARP
設計	Y. KUMAJI
承認	Y. KUMAJI
工程	YH-7B Series
材料	FR-4
寸法	43±0.2
重量	1.2
備考	

SHARP CORPORATION
YH-7C12-01-9
YH-7B Series
Y. KUMAJI
DRAWING NO.

CCD, module, NTSC, YH7C12