SHARP

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To :

# SPECIFICATIONS

Product Type : 1/7-type lens-integrated CMOS Color Area Sensor for CIF

Model No. LZ0P3820

※This specifications contains 24 pages including the cover.
If you have any objections, please contact us before issuing purchasing order.

CUSTOMERS ACCEPTANCE

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LZ0P3820

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  - ·Office electronics
  - ·Instrumentation and measuring equipment
  - ·Machine tools
  - ·Audiovisual equipment
  - ·Home appliances
  - ·Communication equipment other than for trunk lines

  (2) Those contemplating using the products covered herein for the following equipment which demands high reliability, should first contact a sales representative of the company and then accept responsibility for incorporating into the design fail-safe operation, redundancy, and other appropriate measures for ensuring reliability and safety of the equipment and the overall system.
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  - ·Mainframe computers
  - ·Traffic control systems
  - ·Gas leak detectors and automatic cutoff devices
  - ·Rescue and security equipment
  - ·Other safety devices and safety equipment, etc.

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  - ·Communications equipment for trunk lines
  - ·Control equipment for the nuclear power industry
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- Please direct all queries regarding the products covered herein to a sales representative of the company.

CONTENTS

## 1. GENERAL DESCRIPTION

LZ0P3820 is a 1/7-type(approx. 2.6mm) lens-integrated CMOS image sensor. The sensor further includes a timing generatoer(TG), a correlated double sampling(CDS) circuit, an auto gain control(AGC) circuit and an analog-to-digital converter(ADC) circuit. All the circuits of the sensor can be driven by 3.3V single power supply. Having small lens and small LCC-type flat pakage, possible to make ultra-small color camera easily.

### Features

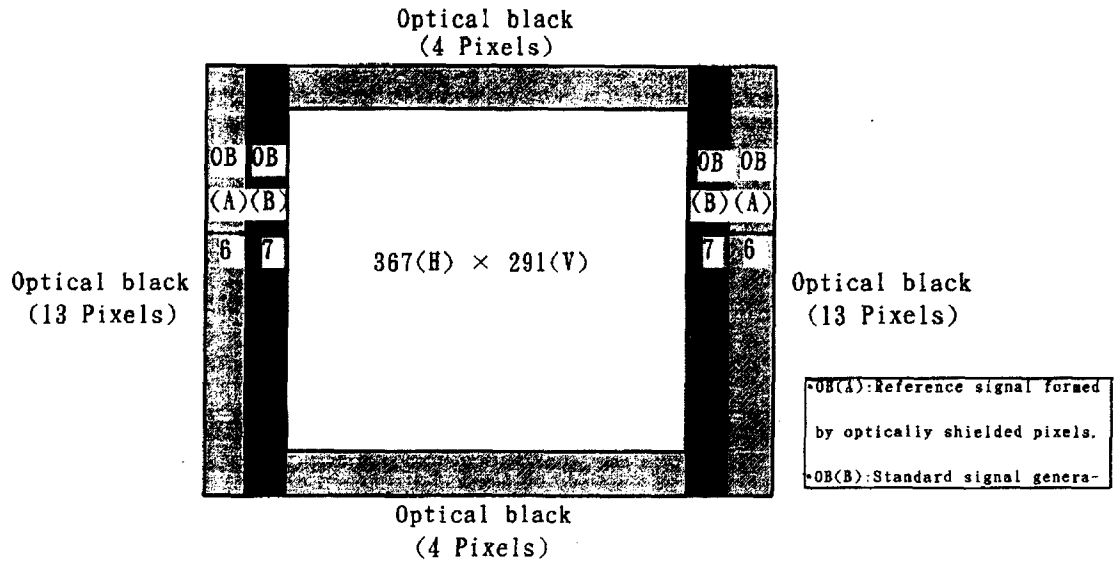
1) Number of image pixels : Horizontal 367 x vertical 291 (approximately 110,000 pixels)
2) Square pixel, Pixel pitch : Horizontal 5.6μm x vertical 5.6μm
3) Progressive acan
4) Compatible with CIF standard
5) Primary color filter composed of R, G, B
6) Analog output and 8-bit digital output
7) Variable electronic shutter (1/30 to 1/10,000 s)
8) Variable gain control (3 to 30 dB)
9) Can be operating by DC3.3V single power supply
10) 36-pin half-pitch LCC-type small pakage (Base section size: 11.5mm×11.5mm max.)
11) pprox. 58° (degrees) of horizontal view angle lens includes.
12) Not designed or rated as radiation hardened

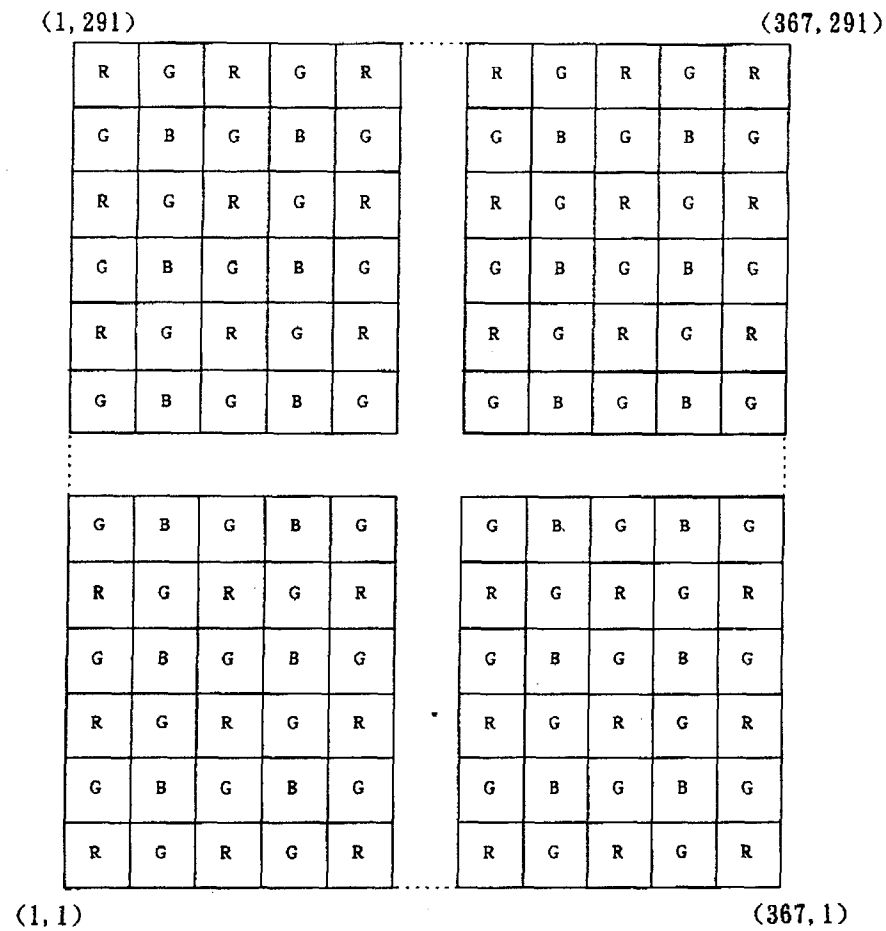
### Applications

Wireless phone camera
Image capture camera for PC, PDA
Amusement (Game, Toy) etc.

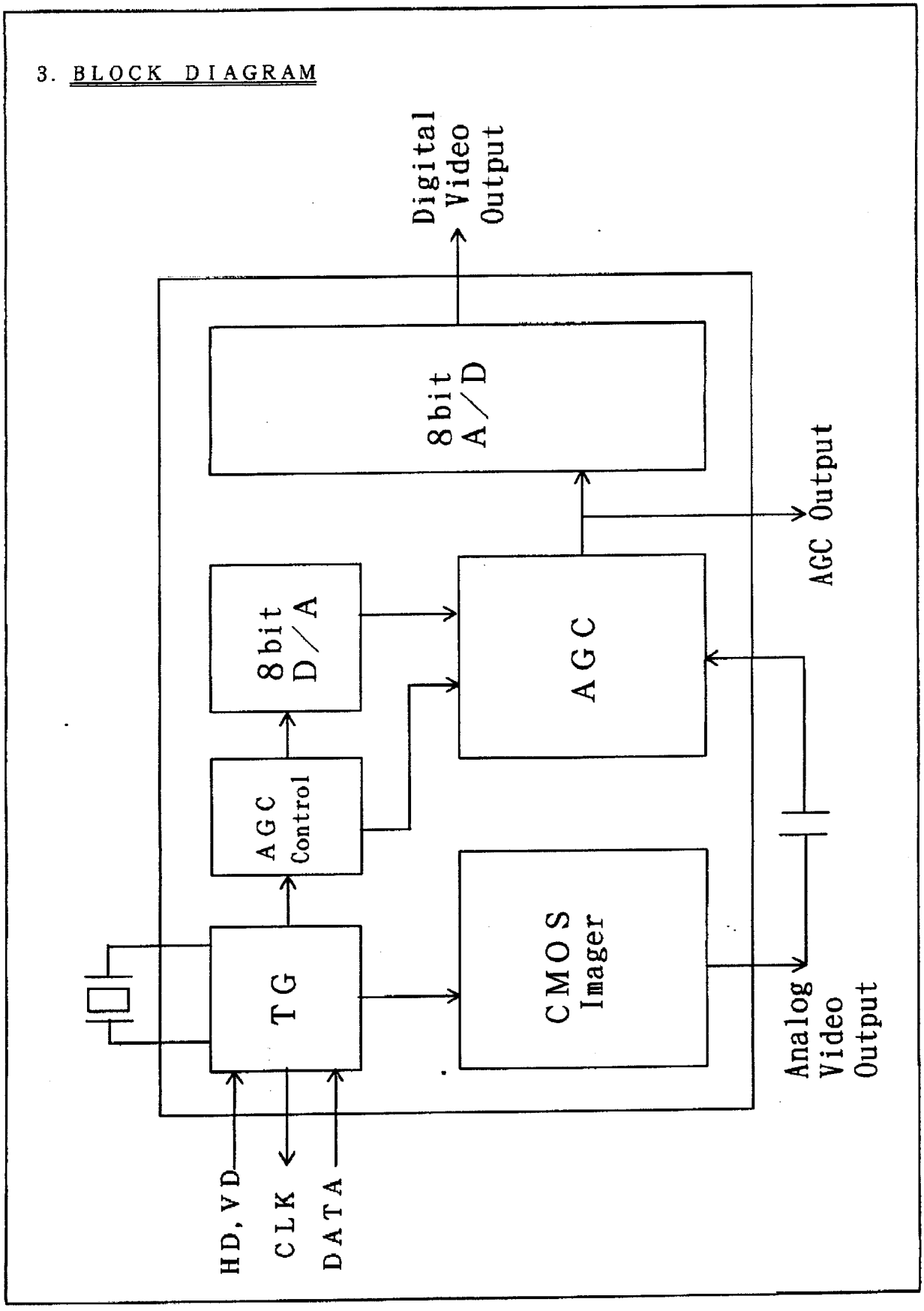
※The circuit diagram and others included in this specification are intended for use to explain typical application examples. Therefore, we take no responsibility for any problem as may occur due to the use of the included circuit and for any problem with industrial proprietary rights or other rights.

## 2. ARRANGEMENT OF PIXELS AND COLOR FILTERS



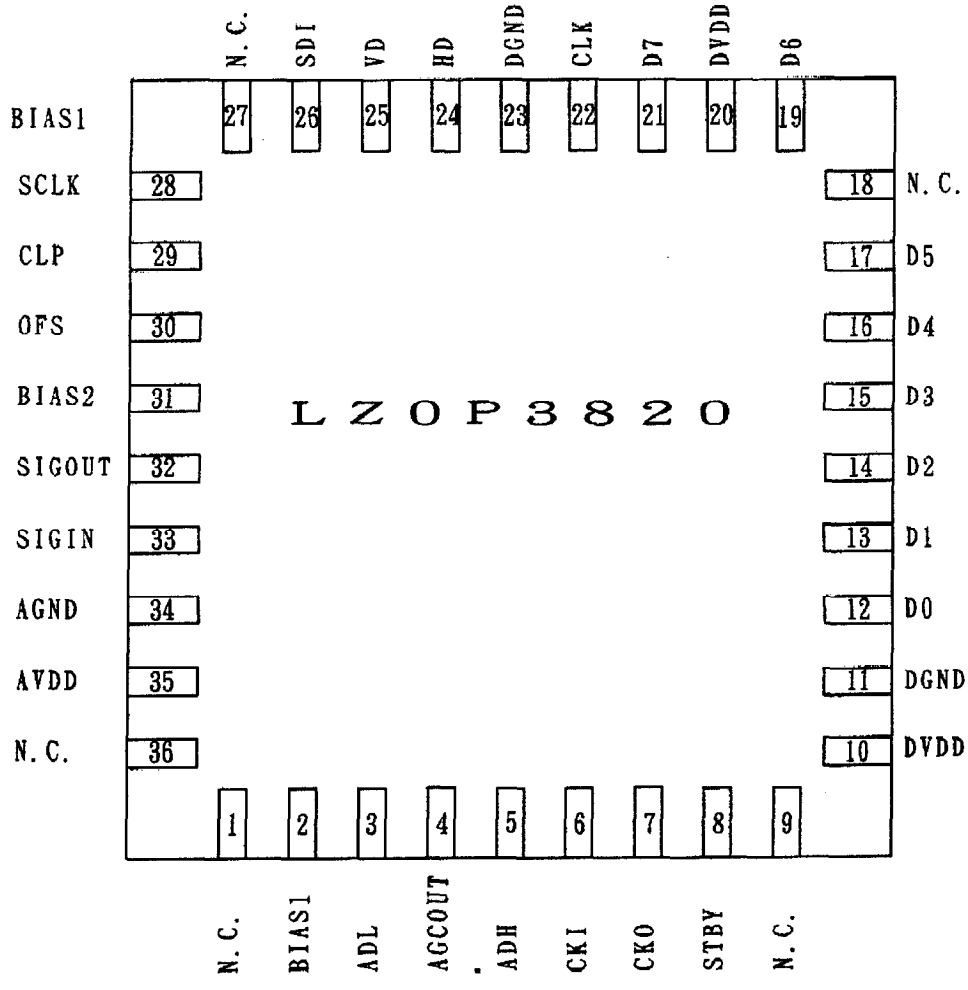



3. BLOCK DIAGRAM



## 4. PIN CONFIGRATION

(TOP VIEW)



## 5. PIN DESCRIPTION

| Pin No. | Symbol | I/O | A/D | Description |
|---|---|---|---|---|
| 1 | N.C. | — | — | No connection |
| 2 | BIAS1 | — | Analog | Analog bias voltage1 for image sensor |
| 3 | ADL | — | Analog | Bottom ADC reference voltage |
| 4 | AGCOUT | Output | Analog | AGC output |
| 5 | ADH | — | Analog | Top ADC reference voltage |
| 6 | CKI | Input | Digital | Clock input for oscillator |
| 7 | CKO | Output | Digital | Clock output for oscillator |
| 8 | STBY | Input | Digital | Control data input for system disable |
| 9 | N.C. | — | — | No connection |
| 10 | DVDD | — | Digital | Digital power supply |
| 11 | DGND | — | Digital | Digital ground |
| 12 | D0 | Output | Digital | ADC signal output 0 (LSB) |
| 13 | D1 | Output | Digital | ADC signal output 1 |
| 14 | D2 | Output | Digital | ADC signal output 2 |
| 15 | D3 | Output | Digital | ADC signal output 3 |
| 16 | D4 | Output | Digital | ADC signal output 4 |
| 17 | D5 | Output | Digital | ADC signal output 5 |
| 18 | N.C. | — | — | No connection |
| 19 | D6 | Output | Digital | ADC signal output 6 |
| 20 | DVDD | — | Digital | Digital power supply |
| 21 | D7 | Output | Digital | ADC signal output 7 (MSB) |
| 22 | CLK | Output | Digital | Reference clock output (9.0MHz) |
| 23 | DGND | — | Digital | Digital ground |
| 24 | HD | Input | Digital | Horizontal drive pulse input |
| 25 | VD | Input | Digital | Vertical drive pulse input |
| 26 | SDI | Input | Digital | Control data input (AGC, EE, Offset etc.) |
| 27 | N.C. | — | — | No connection |
| 28 | SCLK | Input | Digital | Control clock input for SDI |
| 29 | CLP | — | Analog | Analog bias voltage for clamp circuit |
| 30 | OFS | — | Analog | Offset bias voltage for AGC |
| 31 | BIAS2 | — | Analog | Analog bias voltage 2 for image sensor |
| 32 | SIGOUT | Output | Analog | Analog image signal output |
| 33 | SIGIN | Input | Analog | Analog image signal input |
| 34 | AGND | — | Analog | Analog ground |
| 35 | AVDD | — | Analog | Analog power supply |
| 36 | N.C. | — | — | No connection |

## 6. ELECTRIC CHARACTERISTICS

### 6－1. ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Power supply voltage | VDD | －0.3 ～ 4.6 | V |
| Input signal voltage | V$\phi$ | －0.3 ～ VDD＋0.3 | V |
| Storage temperature | Tstr | －20 ～ 70 | ℃ |

### 6－2. RECOMENDED OPERATING CONDITIONS

| Parameter | | Symbol | MIN | TYP | MAX | Unit | Note |
|---|---|---|---|---|---|---|---|
| Power supply voltage | | VDD | 3.0 | 3.3 | 3.6 | V | |
| Operating temperature | | Topr | -10 | 25 | 60 | ℃ | |
| Oscillator frequency | | Fck | | 9.0 | | MHz | |
| Digital input voltage | Low level | V$\phi$L | | | 0.2VDD | V | 1 |
| | High level | V$\phi$H | 0.8VDD | | VDD | V | |
| Analog input voltage | | | (Connect to terminal through capacitor) | | | | 2 |
| Analog bias voltage | | | (Connect to GND through capacitor) | | | | 3 |

Note 1 : Apply to input pins HD, VD, SDI and SCLK.
Note 2 : Apply to input pin SIGIN. Please do not connect to DC directly.
Note 3 : Apply to pins BIAS1, BIAS2, OFS, ADL, DAL, CLP.
Please do not connect to GND directly.

## 7. IMAGING CHARACTERISTICS

Readout mode : 1/30 sec, Normal mode
Ambient temperature : 25 ℃
Driving voltage : 3.3 V
Color temperature of light source : 3200K
• Measurement point : Analog image signal output (pin no. 32) before AGC and AD.

| No. | Parameter | Symbol | Note | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| 1 | Standard output voltage | Vo | (a) | | 150 | | mV |
| 2 | Saturation output voltage | Vsat | (b) | | 800 | | mV |
| 3 | Dark output voltage | Vdark | (c) | | | | mV |
| 4 | Dark signals non-uniformity | DSNU | (d) | | | | mV |
| 5 | Sensitivity (Green channel) | R(G) | (e) | | 300 | | mV |
| 6 | Vertical line Fixed Pattern Noise | VFPN | (f) | | 0.5 | | mVp-p |
| 7 | Resolution (at centaer) | | (g) | 150 | | | TV Line |
| 8 | Resolution (at corner) | | (h) | 100 | | | TV Line |
| 9 | Shading | | (i) | | 30 | | % |
| 10 | Difference of center | | (j) | | | ±10 | % |
| 11 | Current dissipation | IVDD | (k) | | 18 | | mA |

【Note】

(a) Vo is the average output voltage of Green channel int the central area(H/10, V/10) under uniform illumination. The standard exposure condition is defined when Vo is 150 mV.

(b) The image area is divided into 10 x 10 segments under 10 times exposure of the standard exposure condition. The segment's voltage is the average output voltages of all pixels whithin the segments. Vsat is the minimum segment's voltage of all the segments voltage.

(c) Vdark is the difference between average output voltage of the effective area and that of the OB area, under non-exposure condition.

(d) Image area is divided into 10 X 10 segments under non-exposure condition. DSNU is defined by (Vdmax - Vdmin), where Vdmax and Vdmin are the maximum and minimum values of all the segments voltage, respectively.

(e) R(G) is the average output voltage of Green channel at central area(H/10, V/10) when a 1000 lux light source on a 90% reflector is image.

(f) One mean horizontal line signal <bi> is obtained by adding all the horizontal line signals <aij> vertically and dividing them by the line number. <xi> is the deviation of the center pixel from the average of successive 5 pixels in <bi>. V-FPN is the maximum absolute value of <xi>.

(g)The limited resolusion in the central area(H/10, V/10) whitch the image of TV resolusion chart(ex. EIAJ test chart:type-A) can be distinguished on the B/W video monitor when converted into composite video signal.

(h)The limited resolusion in the perpheral area(image height:Y=0.7) under the conditions mentioned above.

(i)Defined following formura at the brightness of standard output voltage.[at G-channel]
(Vco/Vce)X100[%] Vco:output voltage of edge of the image.(image height:Y=0.8)
Vce:output voltage of center of the image.

(j)Difference of center between image and monitor. Ratio of horizontal underscaning monitor size.

(k) IVDD is the total current of analog and digital power supply in the dark and on the standard load condition.

## 8. LENS SPECIFICATIONS

| No | Parameter | Specifications | Note |
|---|---|---|---|
| 1 | Lens Structure | Prastic, Non-spherical, single lens | |
| 2 | Focal Length | 2.0mm ±5% | |
| 3 | F No. | 2. 8 ±5% | |
| 4 | Angle of View | Horizontal:approx. 58° [typ. : Reference] | (a) |
| 5 | TV Distortion | −4.2% | (b) |
| 6 | Focus Adjustment Range | ∞～10cm | (c) |
| 7 | Torque of Focusing | 0.00005～0.001 N・m | (d) |

【Conditions】

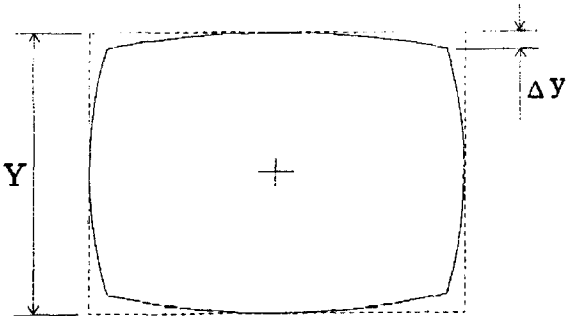
(a) Effective Image Area : (H)2.06 × (V)1.63mm

(b) TV distortion is defined the formura, (△y／Y) ×100 [%]

at capturing rectangular pattern sized Horizontal by Vertcal as 4by 3.

"Y" is defined as the Vertical height of center of Horizontal line.

"y" is defined as the Vertical height of edge of Horizontal line.



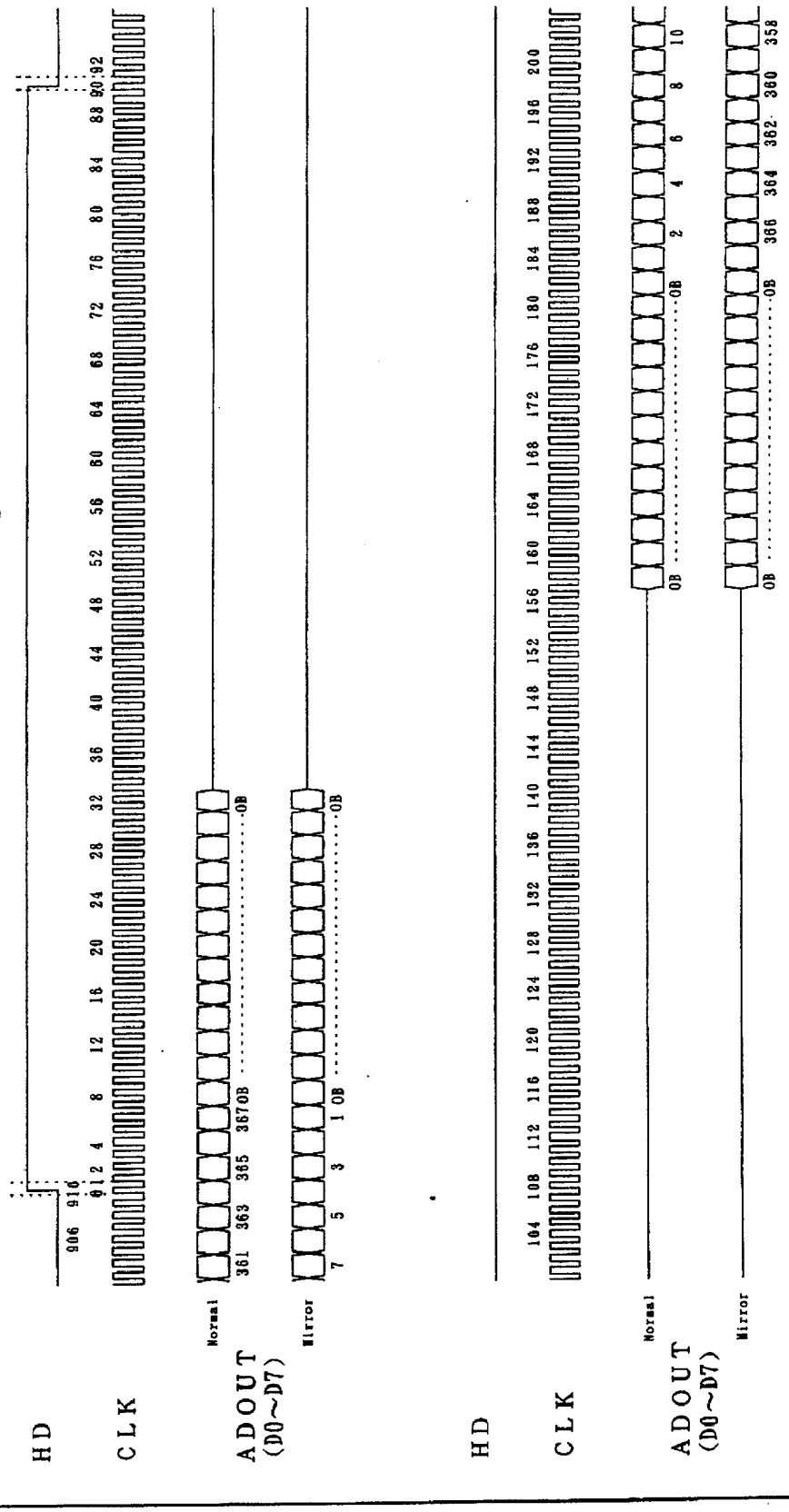

(c) The range isthe best points by adjustment by screwing the lens head.

(d) Toruques which are necessary for turning the lens.

(at shipping of products)

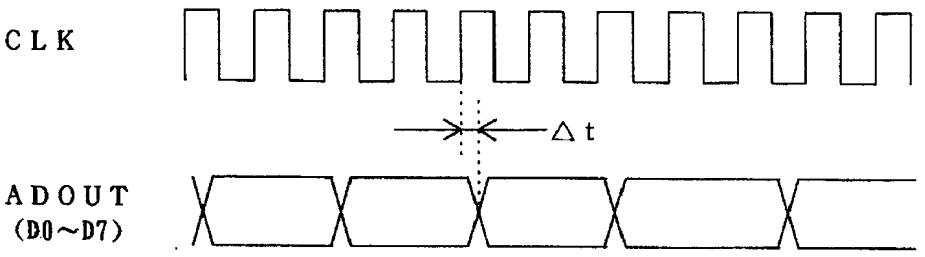
## 9. TIMING DIAGRAM

### 9 – 1. Horizontal Pulse Timing



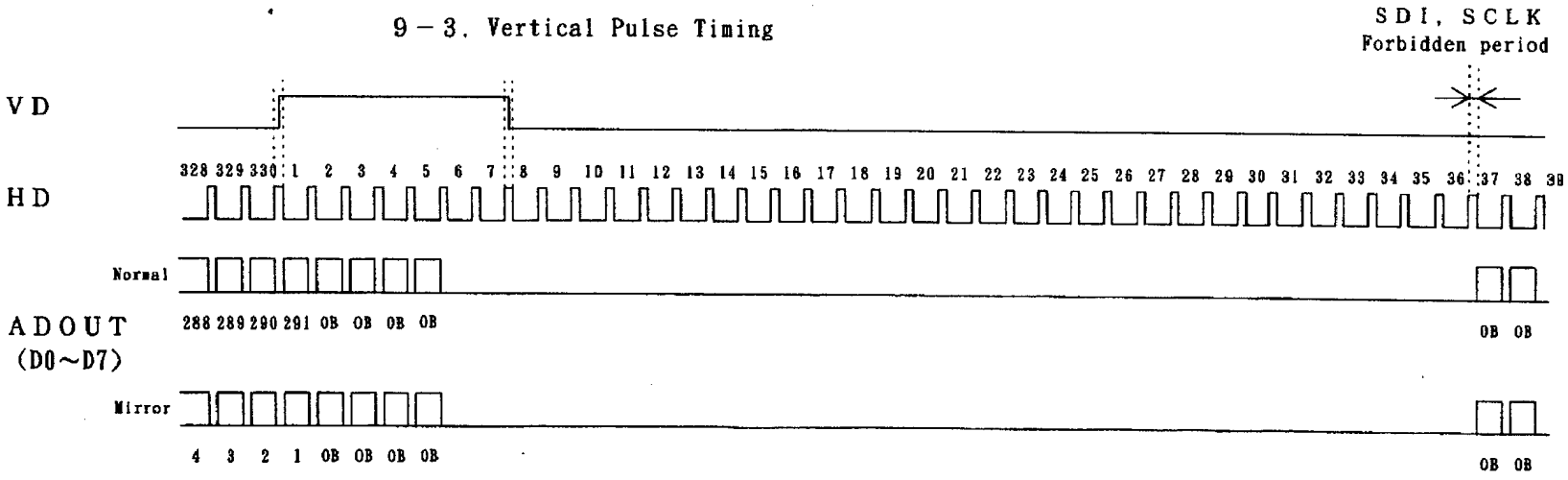

- The rising edge of HD pulse must be between two rising edges of CLK(0) and CLK(1).
- The falling edge of HD pulse must be between two rising edges of CLK(90) and CLK(91).

## 9－2. Phase relations between Digital Output (ADOUT) and Clock (CLK).



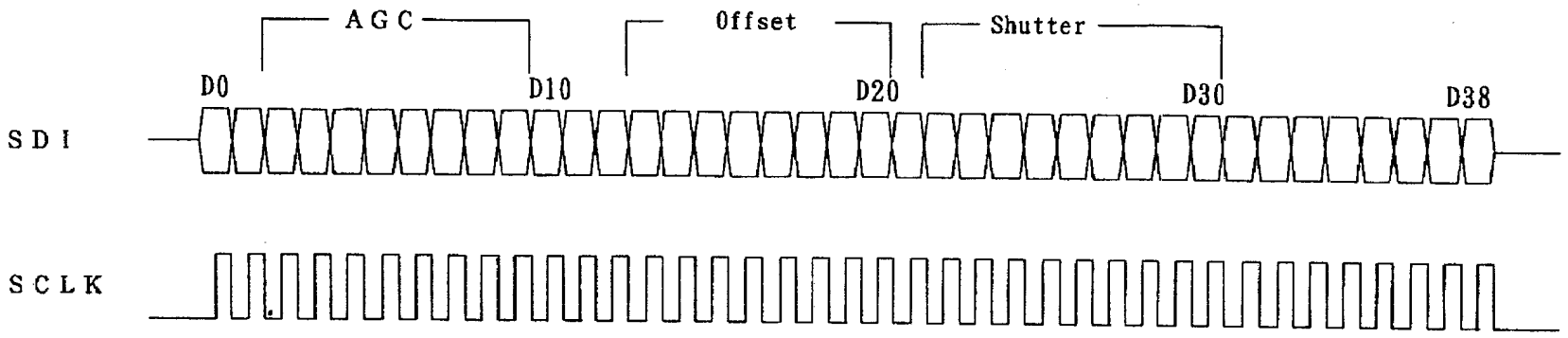

| Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| △t | | TBD | | nS |

## 9－3. Vertical Pulse Timing




• The rising edge and falling edge of VD pulse must be in high period of HD pulses.

## 9 – 4. Serial Data Timing (SDI, SCLK)




- Data in SDI are taken at the rising edge of SCLK.
- Clock frequency of SCLK should be less than 1/2 of that of CLK.
- Do not insert the pulses SDI and SCLK between 36H and 37H, that is described in section 9-3.
- The contents of serial data from D0 to D38 are refered to "Section 10. Description of Serial Data".

## 10. DESCRIPTION OF SERIAL DATA

| Address | Symbol | Function |
|---|---|---|
| D0 | | No use (Fix to Low level) |
| D1 | | |
| D2 | AGC6 (MSB) | Auto gain control (0 to 20 dB) |
| D3 | AGC5 | |
| D4 | AGC4 | |
| D5 | AGC3 | |
| D6 | AGC2 | |
| D7 | AGC1 | |
| D8 | AGC0 (LSB) | |
| D9 | | No use (Fix to Low level) |
| D10 | | |
| D11 | | |
| D12 | | |
| D13 | OFS7 (MSB) | Offset level control of AGC output (0.9 to 1.5 V) |
| D14 | OFS6 | |
| D15 | OFS5 | |
| D16 | OFS4 | |
| D17 | OFS3 | |
| D18 | OFS2 | |
| D19 | OFS1 | |
| D20 | OFS0 (LSB) | |
| D21 | | No use (Fix to Low level) |
| D22 | SHT8 (MSB) | Shutter speed control (Exposure time is 1 to 1/330 frame period) |
| D23 | SHT7 | |
| D24 | SHT6 | |
| D25 | SHT5 | |
| D26 | SHT4 | |
| D27 | SHT3 | |
| D28 | SHT2 | |
| D29 | SHT1 | |
| D30 | SHT0 (LSB) | |
| D31 | MIRH | H:Horizontal mirror inversion image, L:Normal image |
| D32 | MIRV | H:Vertical mirror inversion image, L:Normal image |
| D33 | SAD1 (MSB) | Phase select of AD clock (Fix to Low level) |
| D34 | SAD0 (LSB) | |
| D35 | MAX2 (MSB) | Fixed gain select (3 to 10 dB) |
| D36 | MAX1 | |
| D37 | MAX0 (LSB) | |
| D38 | LPMD | H:Power save mode (AGC and AD off), L:All active |

## 10-1. SETTING OF AUTO GAIN CONTROL

- One LSB of the gain code represents appoximately 0.156dB.
- Nominal gain values at typical codes are shown below.

| Auto Gain Control (dB) | D2 | D3 | D4 | D5 | D6 | D7 | D8 |
|---|---|---|---|---|---|---|---|
| 0 | L | L | L | L | L | L | L |
| 1 | L | L | L | L | H | H | L |
| 2 | L | L | L | H | H | L | H |
| 3 | L | L | H | L | L | H | H |
| 4 | L | L | H | H | L | L | H |
| 5 | L | H | L | L | L | L | L |
| 6 | L | H | L | L | H | H | L |
| 7 | L | H | L | H | H | L | L |
| 8 | L | H | H | L | L | H | H |
| 9 | L | H | H | H | L | L | H |
| 10 | H | L | L | L | L | L | L |
| 11 | H | L | L | L | H | H | L |
| 12 | H | L | L | H | H | L | L |
| 13 | H | L | H | L | L | H | H |
| 14 | H | L | H | H | L | L | H |
| 15 | H | L | H | H | H | H | H |
| 16 | H | H | L | L | H | H | L |
| 17 | H | H | L | H | H | L | L |
| 18 | H | H | H | L | L | H | H |
| 19 | H | H | H | H | L | L | H |
| 20 | H | H | H | H | H | H | H |

## 10-2. SETTING OF OFFSET LEVEL

- One LSB of the offset code represents appoximately 0.002V.
- Nominal offset values at typical codes are shown below.

| Offset Level (V) | D13 | D14 | D15 | D16 | D17 | D18 | D19 | D20 |
|---|---|---|---|---|---|---|---|---|
| 0.9 | L | L | L | L | L | L | L | L |
| 1.0 | L | L | H | L | H | L | H | H |
| 1.1 | L | H | L | H | L | H | L | H |
| 1.2 | H | L | L | L | L | L | L | L |
| 1.3 | H | L | H | L | H | L | H | L |
| 1.4 | H | H | L | H | L | H | L | H |
| 1.5 | H | H | H | H | H | H | H | H |

## 10-3. SETTING OF SHUTTER SPEED

- One LSB of shutter speed code represents 1H, where 1H is HD pulse period.
- Shutter speed values at typical codes are shown below.

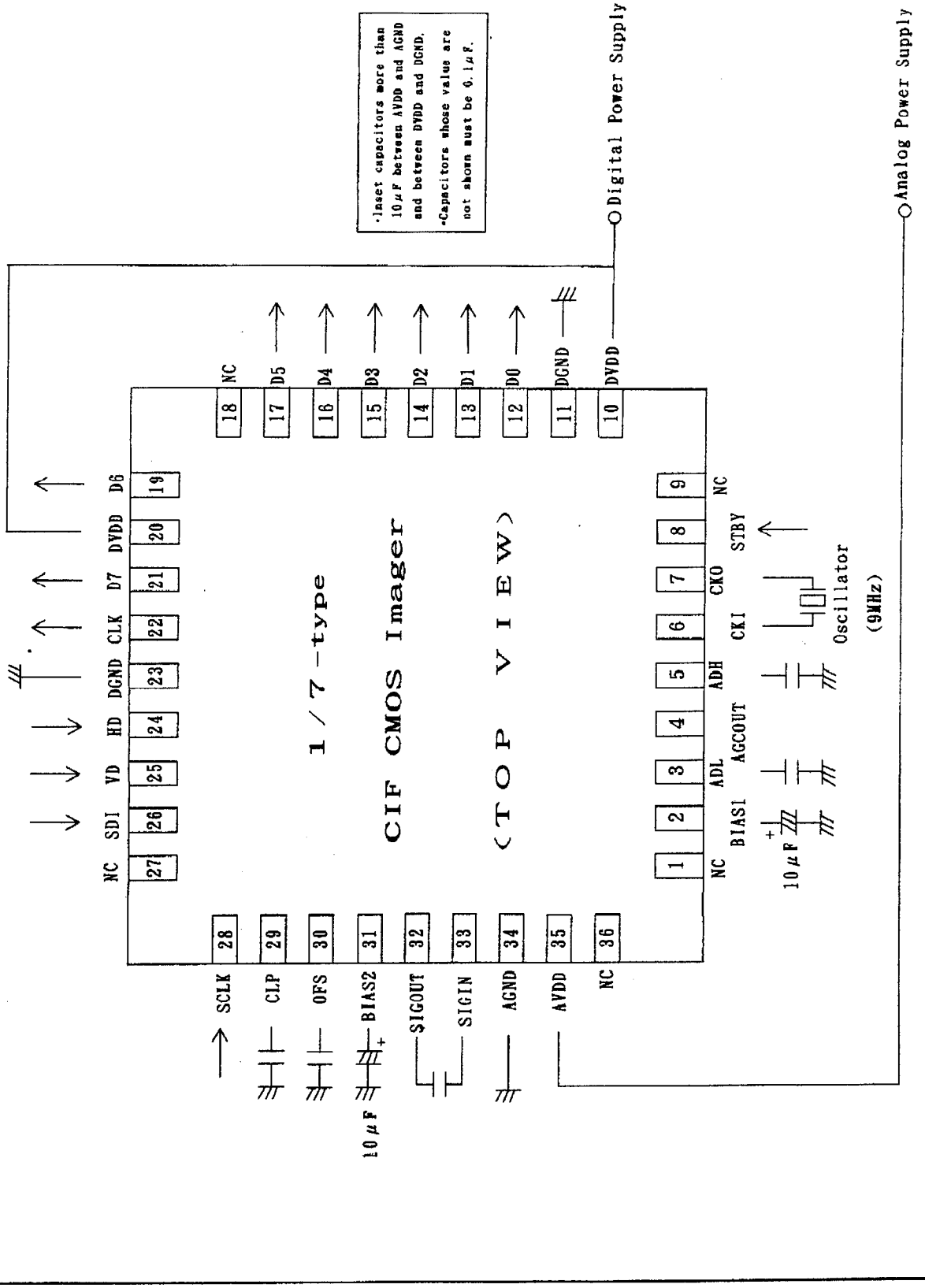
| Shutter speed (Exposure time Unit:H) | D22 | D23 | D24 | D25 | D26 | D27 | D28 | D29 | D30 |
|---|---|---|---|---|---|---|---|---|---|
| 330 | L | L | L | L | L | L | L | L | L |
| 329 | L | L | L | L | L | L | L | L | H |
| 328 | L | L | L | L | L | L | L | H | L |
| • | | | | | | | | | |
| 300 | L | L | L | L | H | H | H | H | L |
| • | | | | | | | | | |
| • | | | | | | | | | |
| 200 | L | H | L | L | L | L | L | H | L |
| • | | | | | | | | | |
| • | | | | | | | | | |
| 100 | L | H | H | H | L | L | H | H | L |
| • | | | | | | | | | |
| • | | | | | | | | | |
| 10 | H | L | H | L | L | L | L | L | L |
| • | | | | | | | | | |
| 3 | H | L | H | L | L | L | H | H | H |
| 2 | H | L | H | L | L | H | L | L | L |
| 1 | H | L | H | L | L | H | L | L | H |

## 10-4. SETTING OF FIXED GAIN

- One LSB of gain code represents 1dB.

| Fixed gain (dB) | D35 | D36 | D37 |
|---|---|---|---|
| 3 | L | L | L |
| 4 | L | L | H |
| 5 | L | H | L |
| 6 | L | H | H |
| 7 | H | L | L |
| 8 | H | L | H |
| 9 | H | H | L |
| 10 | H | H | H |

## 11. EXAMPLE OF OPERATING CIRCUIT



## 12. SPECIFICATION FOR BLEMISH ≪To be determined≫

1) Definition of blemish

• Size of blemish : ≦ 3 lines square by vertical lines.

[For reference] • Size of stain : ≧ 4 lines square by vertical lines.

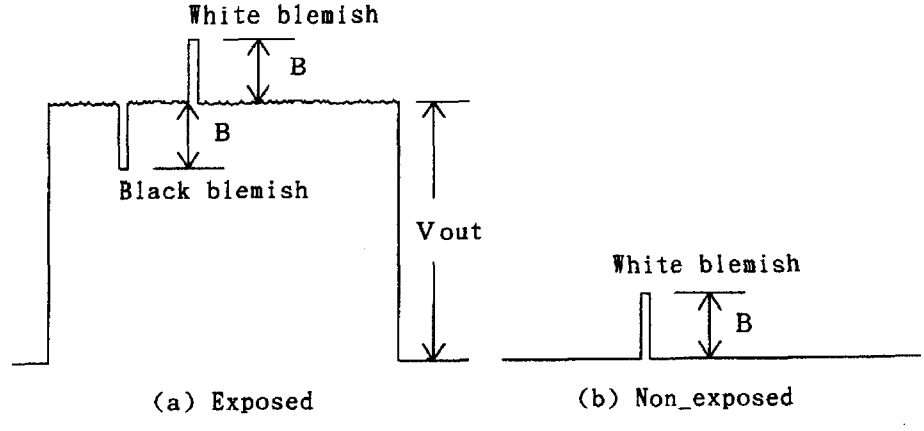
| | Level of blemish (mV) | Permitted number of blemish | Note |
|---|---|---|---|
| White blemish (Exposed) | ≦ B | | • Vout = Vstd (Green channel : 150mV) ※Refer to note below |
| | B < | | |
| Black blemish (Exposed) | ≦ B | | |
| | B < | | |
| White blemish (Non_exposed) | ≦ B | | |
| | ≦ B < | | |
| | ≦ B < | | |
| | B < | | |

《note》

- B : Blemish level defined in fig. below.
- Vout : Average output voltage at Green channel.
- Vstd : 150 mV. The standard output voltage defined in the specification of " 7. Imaging Characteristics "

2) Measureing conditions

- Operating temperature : Topr = 25℃
- Operating voltage : VDD = 3.3V
- Measureing point : Analog image signal output(Pin No. 32) before AGC and AD.




(Vout = 150mV at Green channel)

fig. Definition of blemish level

## 13. CAUTIONS FOR USE

### 1. Package breakage

In order to prevent the package, the lens holder and lens from being broken, follow the instructions below:

1) This CMOS image sensor is a precise optical component and the packaege-base material is ceramic. Therefore, please be careful about the following instructions.
   - Take care not to drop the device when mounting, handling, or transporting.
   - Avoid giving a shock to the package. Especially when leads are fixed to the shocks or the circuit board, a small shock could break the package more easily than when the package isn't fixed.

2) If any damage or breakage occur on the surface of the lens, its characteristics could deteriorate.
   Therefore,
   - Do not hit the Lens.
   - Do not give a shock large enough to cause distortion.
   - Do not scrub or scratch surface of the lens.

   --- Even a soft cloth or applicator, if dry, could cause dust to scratch the Lens.

### 2. Electrostatic Damage

As compared with general MOS-LSI, CMOS image sensor has lower ESD.
Therefore, take the following anti-static measures when handling the CMOS image sensor.

1) Always discharge static electricity by grounding the human body and the instrument to be used. To ground the human body, provide resistance of about 1MΩ between the human body and the ground to be on the safe side.
2) When directly handling the device with the fingers, hold the lens holder and do not touth the lead.
3) To avoid generating static electricity,
   a. do not scrub the body and lens surface with cloth etc.
   b. do not attach any tape or labels.
4) When storing or transporting the device, put it in a container of conductive material.

3. Dust and contamination

Dust or contamination on the surface of lens and the inside of the lens holder could deteriorate the output characteristic or cause a scar. In order to minimize dust or contamination on the device, take the following precautions:

1) Do not remove the lens from the body.
Especially when adjusting macro, be careful not to remove the lens by turning it counterclockwise too much.

2) Do not touch the surface of the lens with the fingers. If dust or contamination gets on the surface of the lens, the following cleaning method is recommended:
- Hnadle the built-in lens CMOS image sensor in a clean environment such as a cleaned booth.
(The cleanliness level should be, if possible, if possible class 1000 at least.)
- Dust from static electricity should be blown off with an ionized air blower. For anti-electrostatic measures, however, ground all the leads on the device before blowing off the dust.
- The contamination on the surface of the lens should be wiped off with a clean applicator soaked in isopropyl alcohol. Wipe slowly and gently in one direction only.
  --- Frequently replace the applicator and do not use the same applicator to clean more than one device.
- Make sure there is no dust or contamination on the lens and screw it on the lens holder.

4. Other

1) Soldering measure and condition.
- Use ESD-measured soldering iron.
- Do not put too much force onto the lens and the lens holder while soldering.
- Be careful not to let the soldering iron touch the lens holder.
  --- Soldering can be quickly/neatly done by laying the soldering iron so it lightly touches the border between the package and the circuit board and sliding it in sideways.

2) There is no guarantee of the performance of the device which has been removed or resoldered after being soldered once under the conditions mentioned above.

3) Avoid using or storing the CMOS image sensor at high temperature or high humidity as it is a precise optical component. Do not give a mechanical shock to the CMOS image sensor.

4) Do not expose the device to strong light. For the color device, long exposure to strong light will fade the color of the color filters.

## 14. PACKAGE OUTLINE AND PACKING SPECIFICATION

1. Package Outline Specification
   Refer to attached drawing

2. Markings
   Marking contents
   (1) Product name : LZ0P3820
   (2) Company name : SHARP
   (3) Country name : JAPAN
   (4) Date code : YY WW D XX

YY — Denotes the production year. (Lower two digits of the year.)
WW — Denotes the production week. (01, 02, 03, • • • •, 52, 53)
D — Denotes the production day of the week.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| SUN. | MON. | TUE. | WED. | THU. | FRI. | SAT. |

XX — Denotes the production ref. code. (1~2figures)

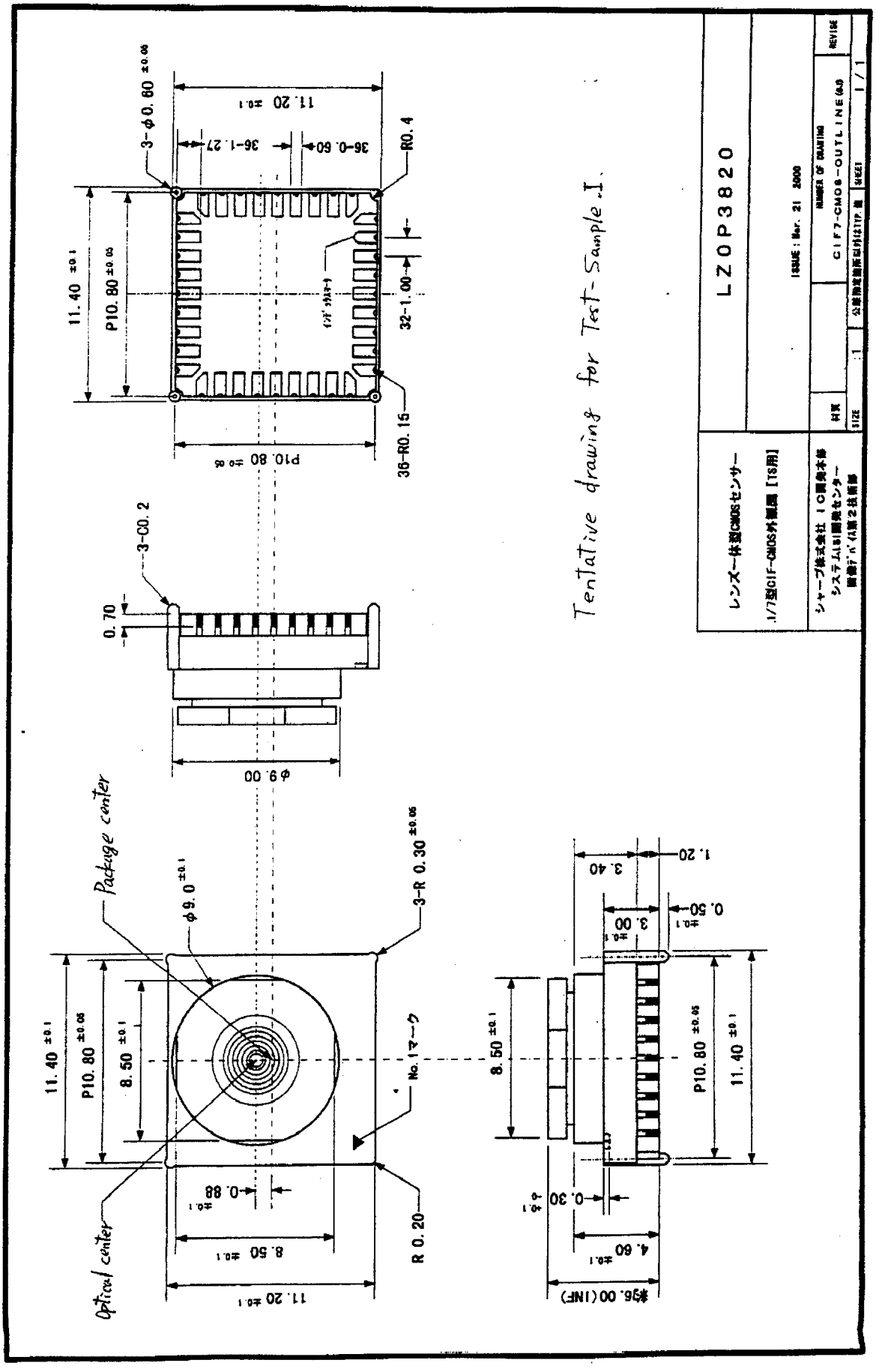
Positions of markings are shown in the package outline drawing.
But, markings shown in theat drawing are not provided any measurements of their charactuers and their positions.

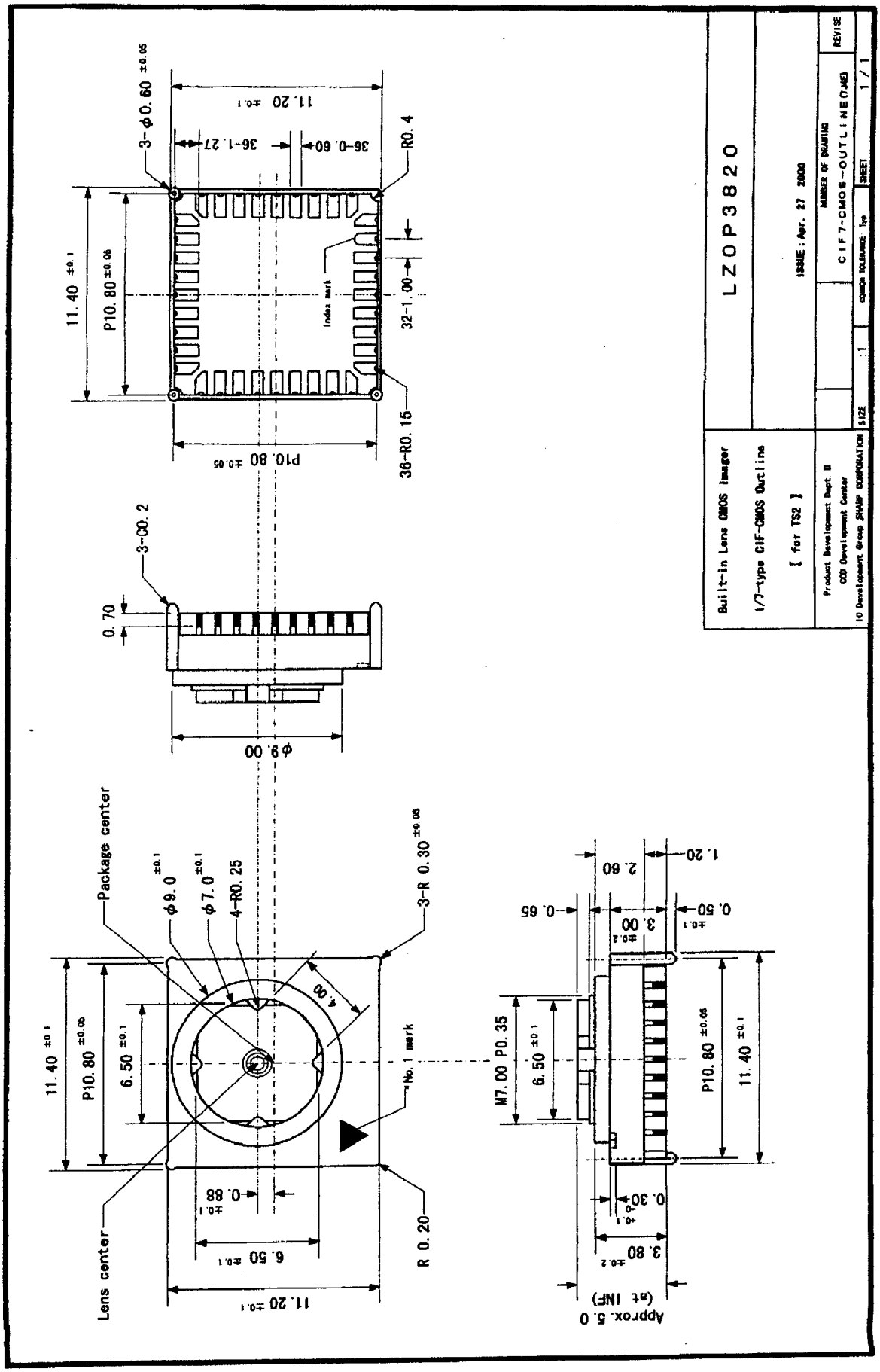
3. Packing Specification
   3 − 1. Packing materials

| Material Name | Material Spec. | Purpose |
|---|---|---|
| Device case | Cardboard(100devices/case) | Device tray fixing |
| Device tray | Conductive plastic (50devices/tray) | Device packing(2trays/case) |
| Cover tray | Conductive plastic(2trays/case) | Device packing |
| Rubber band | | Device tray fixing |
| Buffer | Cardboard | Shock absorber of device tray |
| Cushion bag | Conductive | Device tray fixing |
| Tape | Paper | Sealing cushion bag and device case |
| Label | Paper | Indicates part number, quantity and date of manufacture |

   3 − 2. External appearance of packing
   Refer to attached drawing

4. Precaution
   1) Before unpacking, confirm the imports of the chapter "13. CAUTIONS FOR USE" in this device specifications.
   2) Unpacking should be done on the stand treated with anti-ESD. At that time, the same anti-ESD treatment should be done to operater's body, too.

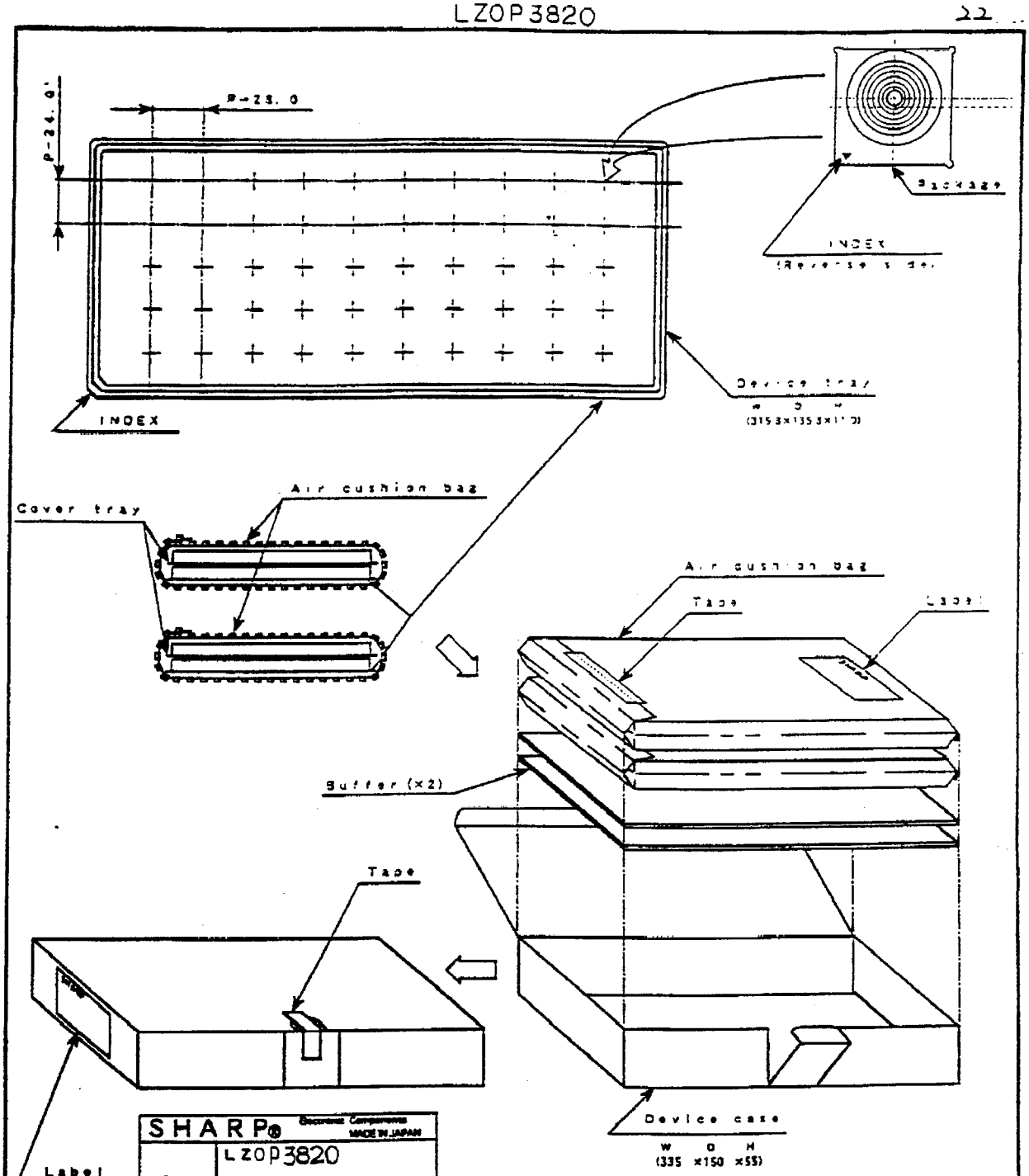

Tentative drawing for Test-Sample I.
LZ0P3820
ISSUE : Mar. 21 2000
CIF7-CMOS-OUTLINE(A0)
Package center
Optical center
No.1マーク
3-R 0.30
R 0.20
3-C0.2
0.70
φ9.00
11.40
P10.80
8.50
11.20
0.88
8.50
4.60
0.30
3.40
3.00
0.50
1.20
P10.80
11.40
*36.00(INF)
3-φ0.80
11.20
36-0.60
36-1.27
R0.4
32-1.00
36-R0.15
P10.80
11.40
P10.80


LZOP3820
ISSUE : Apr. 27 2000
Built-in Lens CMOS Imager
1/7-type CIF-CMOS Outline
( for TS2 )
Product Development Dept. II
CCD Development Center
IC Development Group SHARP CORPORATION
NUMBER OF DRAWING
CIF7-CMOS-OUTLINE(J4E)
REVISE
SIZE
SHEET 1/1
3-φ0.60 ±0.05
11.20 ±0.1
36-0.60
36-1.27
R0.4
11.40 ±0.1
P10.80 ±0.05
Index mark
32-1.00
36-R0.15
P10.80 ±0.05
3-C0.2
0.70
φ9.00
Package center
φ9.0 ±0.1
φ7.0 ±0.1
4-R0.25
3-R 0.30 ±0.05
45°
No.1 mark
6.50 ±0.1
0.88 ±0.1
6.50 ±0.1
11.20 ±0.1
Lens center
R 0.20
2.60
1.20
0.65
0.50 ±0.1
3.00 ±0.2
M7.00 P0.35
6.50 ±0.1
P10.80 ±0.05
11.40 ±0.1
0.30 +0.1
3.80 ±0.2
Approx. 5.0 (at INF)

SHARP

LZOP3820






(UNIT : mm)

| 材質 MATERIAL | 仕 上 FINISH | 名 称 NAME | External Appearance of Packing |
|---|---|---|---|
| | | コード CODE | |
| MODULE ASSEMBLY APPLICATION ENGINEERING DEPARTMENT | | | |
| INTEGRATED CIRCUITS (IC) GROUP | | 図 番 DRAWING No. | LC-HZ3820A |
| SHARP CORPORATION | | | |