SPEC. No. ED-00142A

ISSUE July 2, 2001

SHARP

OPTO-ELECTRONIC DEVICES DIVISION
ELECTRONIC COMPONENTS GROUP
SHARP CORPORATION

SPECIFICATION

DEVICE SPECIFICATION FOR

Infrared Detecting unit
for Remote Control

MODEL No.

GP1UD26XK series

Specified for

Enclosed please find copies of the Specifications which consists of 13 pages including cover.
After confirmation of the contents, please be sure to send back ☐ copies of the Specifications with approving signature on each.

CUSTOMER'S APPROVAL

DATE

BY

PRESENTED

DATE

BY

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Engineering Dept., Ⅲ
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SHARP CORPORATION

SPEC No. ED-00142A

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Product name : Infrared Detecting unit for Remote Control

Model No. : GP1UD26XK series

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2. When using this product, please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets, as well as the precautions mentioned below. Sharp assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets, and the precautions mentioned below.

   (Precautions)

   (1) This product is designed for use in the following application areas ;

   [• OA equipment • Audio visual equipment • Home appliances
   • Telecommunication equipment (Terminal)]

   If the use of the product in the above application areas is for equipment listed in paragraphs (2) or (3), please be sure to observe the precautions given in those respective paragraphs.

   (2) Appropriate measures, such as fail-safe design and redundant design considering the safety design of the overall system and equipment, should be taken to ensure reliability and safety when this product is used for equipment which demands high reliability and safety in function and precision, such as ;

   [• Transportation control and safety equipment (aircraft, train, automobile etc.)
   • Traffic signals • Gas leakage sensor breakers • Rescue and security equipment
   • Other safety equipment]

   (3) Please do not use this product for equipment which require extremely high reliability and safety in function and precision, such as ;

   [• Space equipment • Telecommunication equipment (for trunk lines)
   • Nuclear power control equipment • Medical equipment]

   (4) Please contact and consult with a Sharp sales representative if there are any questions regarding interpretation of the above three paragraphs.

3. Please contact and consult with a Sharp sales representative for any questions about this product.

1. Application

This specifications applies to the model marked "○" in the following models of infrared detecting unit for remote control.

The model list of GP1UD26XK series

Application	Model No.	B.P.F. center frequency (TYP)
	GP1UD26XK	40 kHz
	GP1UD260XK	36 kHz
	GP1UD261XK	38 kHz
	GP1UD262XK	36.7 kHz
	GP1UD263XK	32.75 kHz
	GP1UD267XK	56.8 kHz

Main application : TV set, VCR, Radio cassette recorder, Stereo

2. Outline

Refer to the attached sheet, Page 9.

3. Ratings and characteristics

Refer to the attached sheet, Page 5 to 8.

4. Reliability

Refer to the attached sheet, Page 10.

5. Outgoing inspection

Refer to the attached sheet, Page 11.

6. Supplement

1) This infrared detecting unit for remote control satisfies each performance requirements in para. 3.5, in the standard optical system in Fig.2.

2) This product is built-in photodiode.

3) Production place indication of overseas production shall follow the indication in the drawing of the outline dimensions.

4) Product mass : Approx. 1.0g

5) This product shall not contain the following materials.
Also, the following materials shall not be used in the production process for this product.

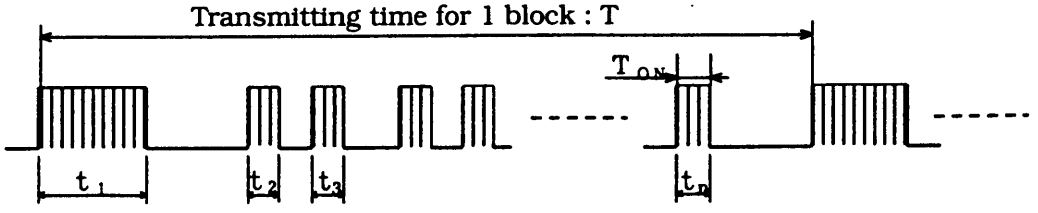
Materials for ODS : CFC_S, Halon, Carbon tetrachloride
1.1.1-Trichloroethane (Methylchloroform)

6) Brominated flame retardants
Specific brominated flame retardants such as the $PBBO_S$ and PBB_S are not used in this device at all.

7) Package specification : Refer to the attached sheet, Page 12.

7. Notes

1) When this infrared remote control detecting unit shall be adopted for wireless remote control, please use it with the signal format of transmitter, which total duty ratio D_t (Emitting time $\sum_{N=1}^{n} t_N$ / Transmitting time for 1 block T) is 40% or less. ON signal time T_{ON} (Pulse width of the presence of modulated IR) should be 250 μs or more. In case that the signal format of total duty and ON signal time is out of above conditions, there is a case that reception distance is much reduced or output is not appeared.



$$D_t = \left(\sum_{N=1}^{n} t_N / T\right) \times 100 \ (\%)$$

2) Please use a light emitting unit (remote control transmitter) taking into consideration such factors as the performances, characteristics and operating condition of the light emitting element and the characteristics of this light detecting unit.

3) If the surface of detector is smeared with dust or dirt, it may cause faulty operation. Caution shall be taken to avoid this. And do not touch the detector surface. If the surface was smeared, wipe it clean with soft cloth. If any solvent is needed, Methyl alcohol, Ethyl alcohol, or Isopropyl alcohol should be used. Please don't carry out washing. Because, after washing the remainder in solvent or flux in this device cause malfunction. Marking on this device is defaced by washing.

4) The shield case shall be grounded on the PCB pattern.
(There are two cases that shield case and GND pin are connected in the shield case, or are not connected in it.)

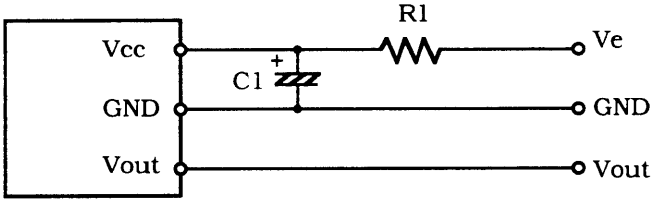
5) It shall not be applied the terminal and case with unnecessary stress.

6) Please don't push the detecting side (photodiode) from external.

7) In order to prevent electrostatic discharge of integrated circuit, human body and soldering iron, etc. shall be grounded.

8) The holes and the slits on the infrared detecting unit shall not be used as the other purpose to maintain its performance.

9) Recommended external circuit (External parts should be mounted as close as possible to the sensor.)



R1=47Ω±5%

C1=47μF

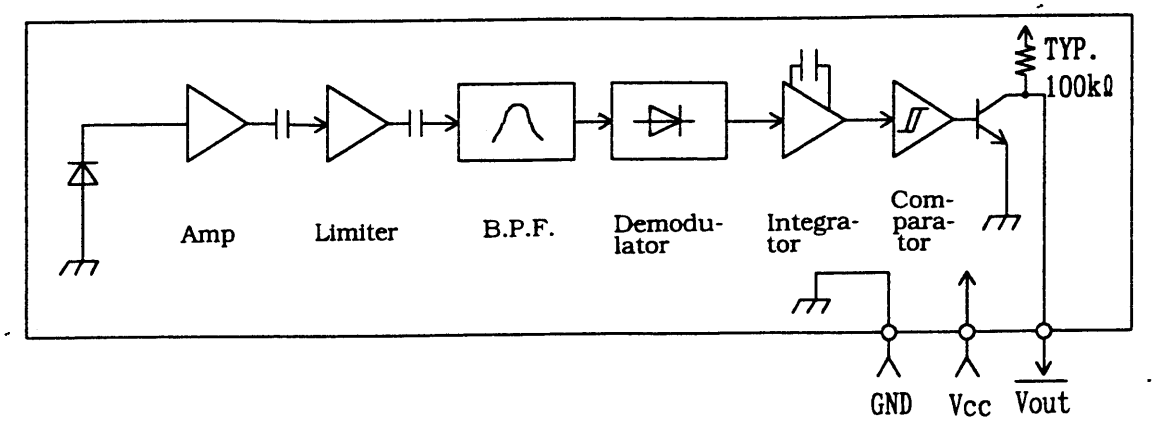
The circuit constant is a example. It is difference from mounting equipment. Please select it by your mounting equipment.

10) There is a possibility that noise on output may be caused by environmental condition (Disturbing light noise, Electromagnetic noise, Power supply line noise, etc.) even if there is no input transmission signal.

11) Please shall confirm operation or your actual machine. Because the output pulse width of this product is fluctuated by environmental conditions such as signal format, temperature, distance from transmitter, and so on.

3. Ratings and characteristics

3.1 Schematic

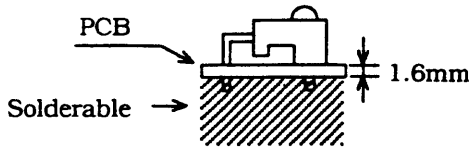


3.2 Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Supply voltage	Vcc	0 to 6.0	V
Operating temperature	Topr	-10 to +70 ※1	℃
Storage temperature	Tstg	-20 to +70	℃
Soldering temperature	Tsol	260 (Soldering time : 5s)	℃

※1) No dew formation
※2) 1.6mm at mounting on single-sided PCB

Unit



3.3 Recommended operating conditions

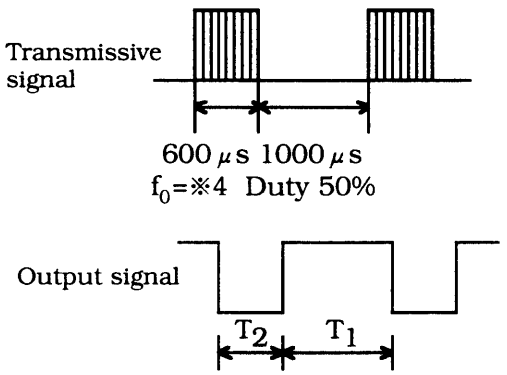
Parameter	Symbol	Operating condition	Unit
Supply voltage	Vcc	2.7 to 5.5	V

3.4 Electrical characteristics

(Unspecified Ta=25℃, Vcc=+3V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Remark
Current dissipation	Icc	-	-	200	μA	No input light
High level output voltage	V_{OH}	Vcc-0.5	-	-	V	※3
Low level output voltage	V_{OL}	-	-	0.5	V	※3 I_{OL}=100μA
High level pulse width	T_1	700	-	1200	μs	※3
Low level pulse width	T_2	400	-	900	μs	※3
B.P.F. center frequency	f_0	-	※4	-	kHz	

※3) The burst wave as shown in the figure on the right shall be transmitted by the transmitter shown in Fig.1. However, the carrier frequency of transmitter is same as ※4. Measuring shall be from just after starting the transmission until 50 pulse.



※4) B.P.F. center frequency : f_0 of each model is shown in the list below.

Model No.	B.P.F. center frequency (TYP)
GP1UD26XK	40 kHz
GP1UD260XK	36 kHz
GP1UD261XK	38 kHz
GP1UD262XK	36.7 kHz
GP1UD263XK	32.75 kHz
GP1UD267XK	56.8 kHz

3.5 Performance

The output signal of this infrared detecting unit shall satisfy the following requirements with the transmitter shown in Fig.1 used in the standard optical system in Fig.2.

3.5.1 Characteristics of linear reception distance

The output signal shall satisfy the electrical characteristic requirements in para. 3.4 at L=0.2 to 10.0m, (※5) Ev< 10 ℓx, ϕ=0° in Fig.2.

3.5.2 Characteristics of sensitivity angle reception distance

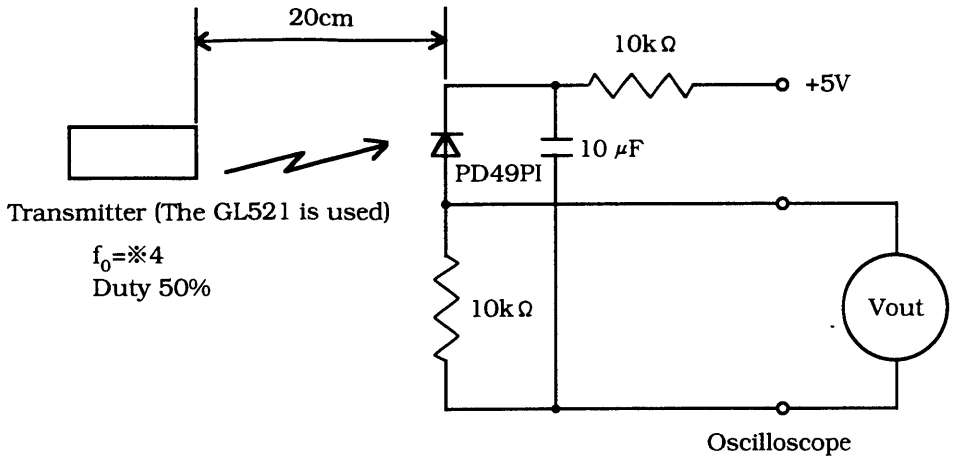
The output signal shall satisfy the electrical characteristic requirements in para. 3.4 at L=0.2 to 7.5m, (※5) Ev< 10 ℓx, $\phi \leqq 30°$ in Fig.2.

3.5.3 Characteristics of anti-outer peripheral light reception distance

The output signal shall satisfy the electrical characteristic requirements in para. 3.4 at L=0.2 to 5.0m, (※5, ※6) Ev≦300 ℓx, ϕ=0° in Fig.2.

※5) It refers to detector face illuminance.

※6) Outer peripheral light source: CIE standard light source A shall be used and placed at 45° from the perpendicular axis at the detector face center.



In the figure above, the transmitter shall be set as the output Vout(p-p) will be 40mV. Note that the PD49PI in this application is The one with short-circuit current Isc=2.6 μA measured at Ev=100 ℓx. (Ev is the illuminance by CIE standard light source A (tungsten lamp)).

Fig. 1 Transmitter

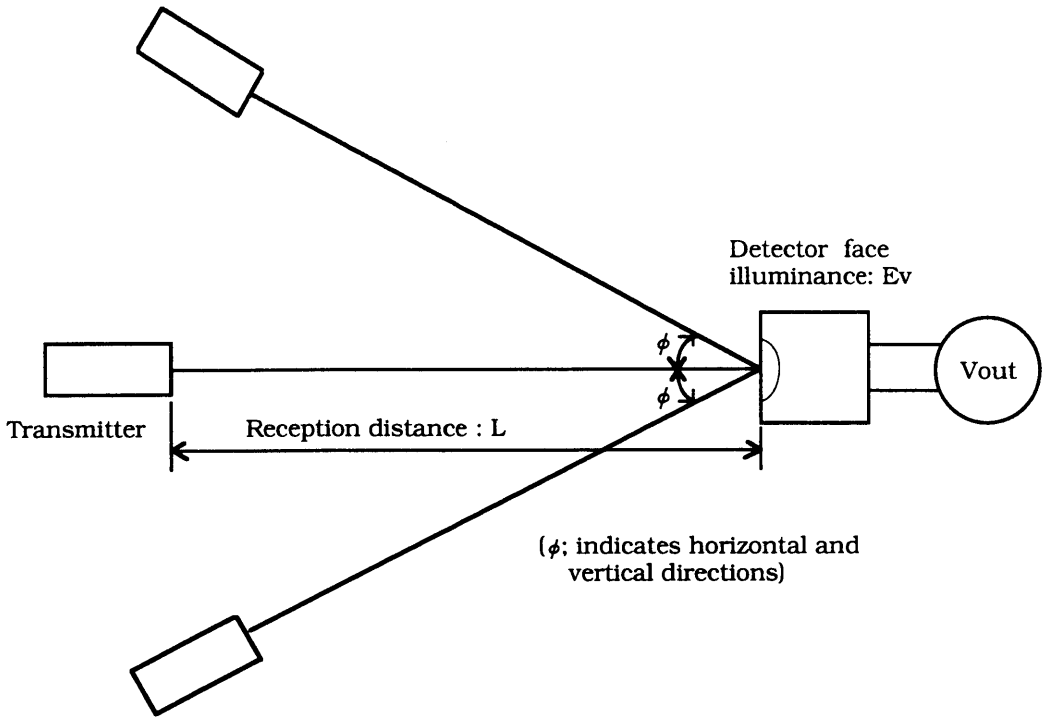


Fig.2 Standard optical system

* Stamp : Stamp (Black)

Stamp list

Model No.	Stamp
GP1UD26XK	Without
GP1UD261XK	1
GP1UD262XK	2
GP1UD263XK	3
GP1UD267XK	7
GP1UD260XK	0

Model name

1021 (—)

Week (1 to 6)
Month (1 to Z)
Year (2000: 0)

The "—" mark inside ( ) shows overseas production place. (*2)

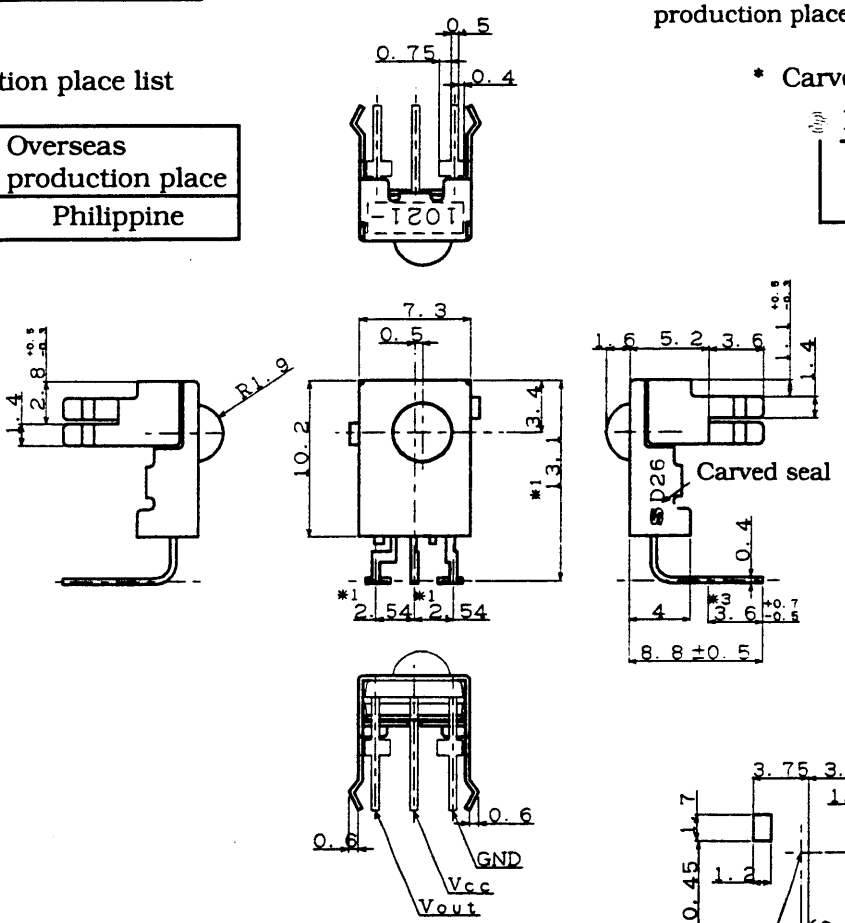
Production place list

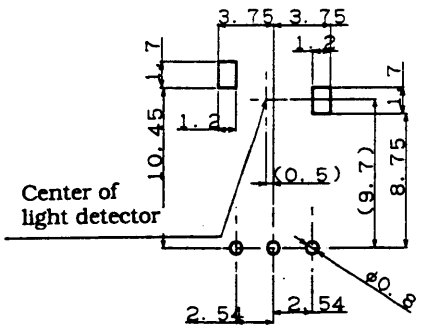
Lot No.	Overseas production place
1021—	Philippine

* Carved seal

D26

Model No. GP1UD26XK series
Sharp mark





Example of mounting drawing from solder side (Reference)

1. *1 indicates root dimensions of connector.
2. Unspecified tolerance : ±0.3
3. Case thickness : 0.3TYP.
4. Case material : Fe
5. Case finish : Solder plating (Pb10%)
6. Lead material : Fe (Ag plating)
7. Lead edge finish : Solder plating or solder dip
8. Mold resin : Epoxy resin
9. Product mass : Approx. 1.0g
10. Dimensions in parenthesis are shown for reference.
11. *2 : Indication "—" mark next to the lot number of "week" mark shows overseas production. (Production country is referred to the indication of overseas production place list.)
12. *3 : Exclude sagged solder

Scale	Name	GP1UD26XK series Outline Dimensions
2/1		
Unit	Drawing No.	SOD03793
1=1/1mm		

4. Reliability

The reliability of products shall satisfy items listed below.

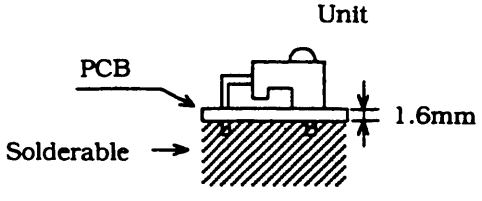
Confidence level : 90%
LTPD : 10%/20%

Test Items	Test Conditions	Failure Judgement Criteria	Samples (n) Defective(C)
Terminal strength (Tension)	Weight : 5N 30s/each terminal	Performance test in para. 3.5 should not be satisfied.	n=11, C=0
Terminal strength (Bending)	Weight : 2.5N 0° -90° -0° 2 times/each terminal		n=11, C=0
Shock	Acceleration: 1000m/s^2 6ms, 3directions/3times		n=11, C=0
Variable frequency vibration	Frequency range: 10 to 55Hz/sweep 1min Overall amplitude: 1.5mm X, Y, Z/2h each		n=11, C=0
* High temp. and high humidity storage	Ta=40℃, 90%RH, t=240h		n=22, C=0
* High temp. storage	Ta=70℃, t=240h		n=22, C=0
* Low temp. storage	Ta=-20℃, t=240h		n=22, C=0
* Temperature cycling	1cycle -20℃ to +70℃ (30min) (30min) 20cycles test		n=22, C=0
* Operation life (High temperature)	Ta=70℃, Vcc=3V, t=240h		n=22, C=0
Solder heat	260±5℃, 5s (1.6mm at mounting on single-sided PCB)		n=11, C=0

In the test *mark above, the sample to be tested shall be left at normal temperature and humidity for 2hours after it is taken out of the chamber. (No dew point)

Solder heat tests the unit which is soldered such as Fig.3.

Fig.3



5. Outgoing inspection

(1) Inspection lot

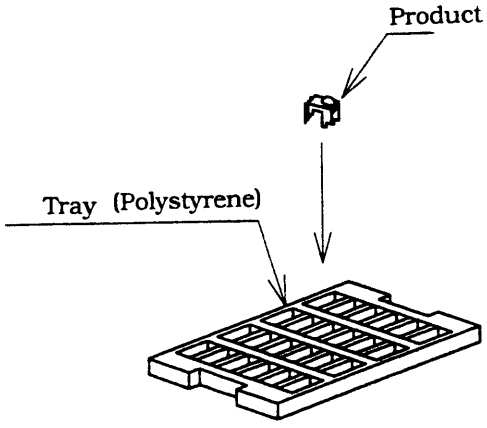
Inspection shall be carried out per each delivery lot.

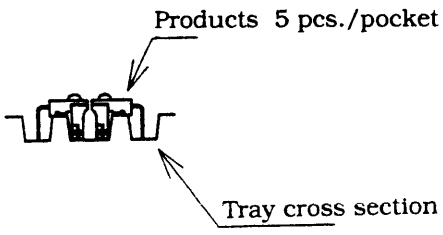
(2) Inspection method

A single sampling plan, normal inspection level II based on ISO 2859 shall be applied.

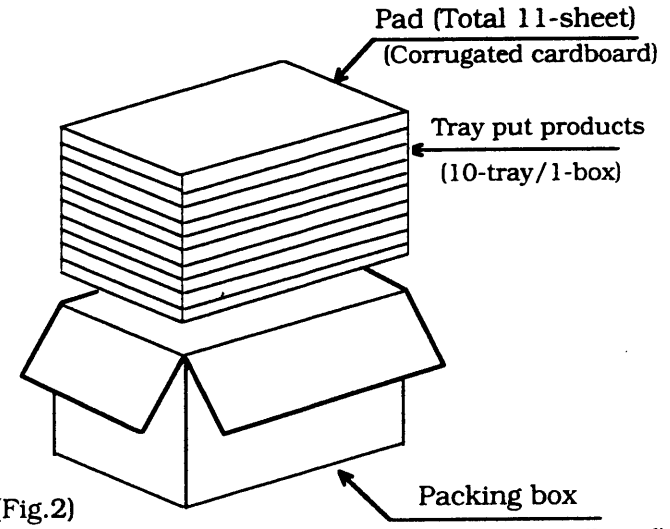
Classification of Defects		Inspection Items	AQL (%)
Major defect	1	Electrical characteristic defect of V_{OH}, V_{OL}, T_1 and T_2 in para. 3.4.	0.4
	2	Distance between signal terminal and shield case (0.2mm or more) (Except for GND terminal)	
	3	It should have no remarkable stains and cracks that give any influence of electrical characteristic on light detecting face.	
Minor defect	1	Transformation of shield case (Satisfying outline dimensions of item 2)	1.5
	2	Stamp, Carved seal (It should be possible to read stamp and carved seal of item 2. Stamp and carved seal should be indicated at fixed position.)	

Package drawings

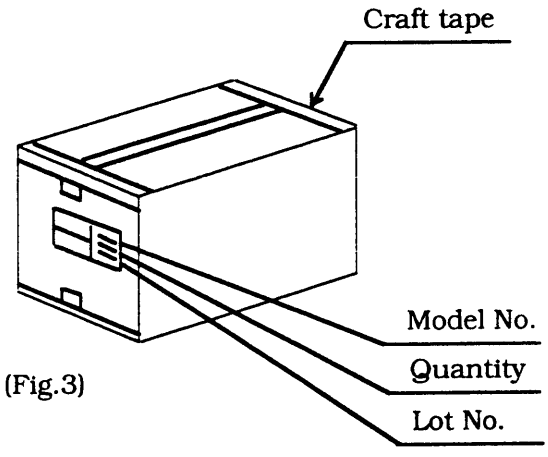




(Fig. 1)



(Fig.2)



(Fig.3)

Packaging method

1. Put products of 200pcs. in tray.
   Put direction is showed in the above fig. (Fig. 1)

2. Put them (10-tray) in the packing box.
   Put pads on their top and bottom, between pads. (Fig. 2)

3. Seal the packing box with craft tape.
   Print the Model No., Quantity and Lot No.
   (2000 pcs./a packing box) (Fig.3)

- Product mass at 2000pcs./package :
  Approximately 3.23kg

Scale	Name	GP1UD26XK series Packing specification
/		
Unit	Drawing No.	SOD03794A
1= / mm		