

GP1S194HCZ0F

Gap : 1.7mm, Slit : 0.3mm
Phototransistor Output,
Compact Transmissive
Photointerrupter



■Description

GP1S194HCZ0F is a compact and low-profile, transmissive photointerrupter with photo-transistor output and detects an object between the emitter and the detector.

The compact package has been molded by a unique technology that is a combination of transfer and injection molding.

■Agency approvals/Compliance

1. Compliant with RoHS directive (2002/95/EC)

■Applications

1. General purpose detection of object presence or motion.
Example : Printer, lens control for camera

■Features

1. Transmissive with phototransistor output
2. Compact Gap Width : 1.7mm
3. Slit Width (detector side): 0.3mm
4. Package : 3.6×2.0×2.7mm
5. RoHS directive compliant

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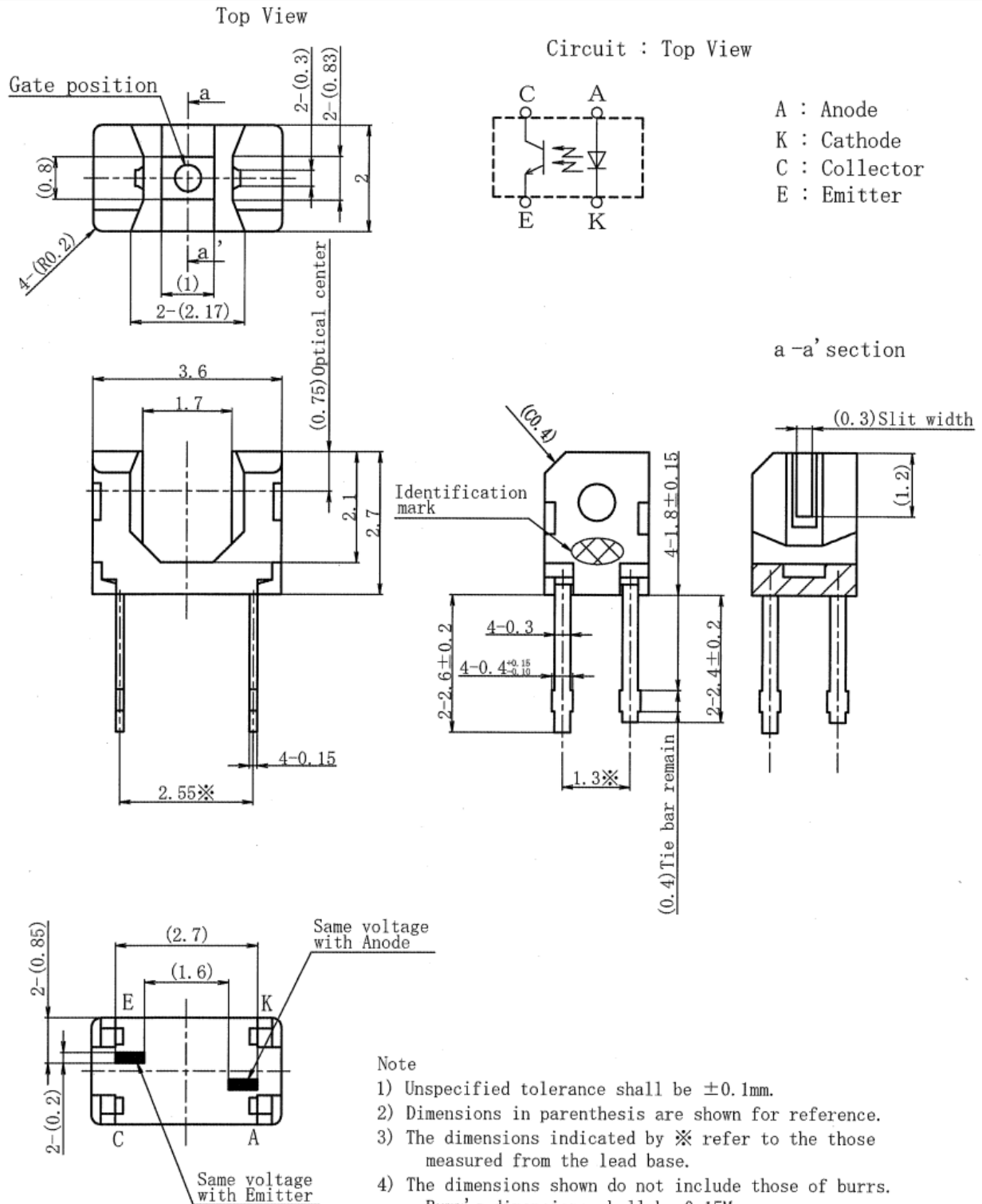
Sheet No.: OP13028EN

Outline

Drawing No.CY12950i02

Scale : 10/1

Unit : mm

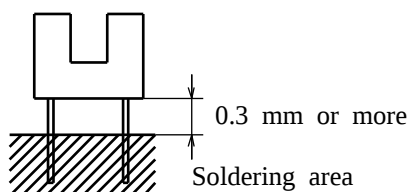


■ Absolute maximum ratings

Ta=25°C

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	30	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	20	mA
	Collector power dissipation	P_C	75	mW
Total power dissipation		P_{tot}	100	mW
Operating temperature		T_{opr}	-25 to +85	°C
Storage temperature		T_{stg}	-40 to +100	°C
* Soldering temperature		T_{sol}	260	°C

* Soldering time : 3 s or less

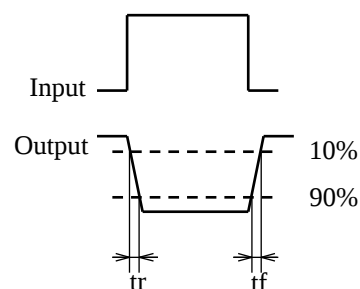
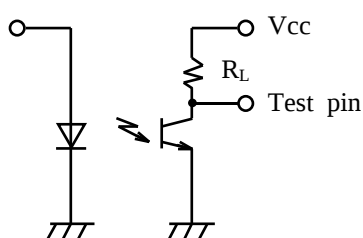


■ Electro-optical characteristics

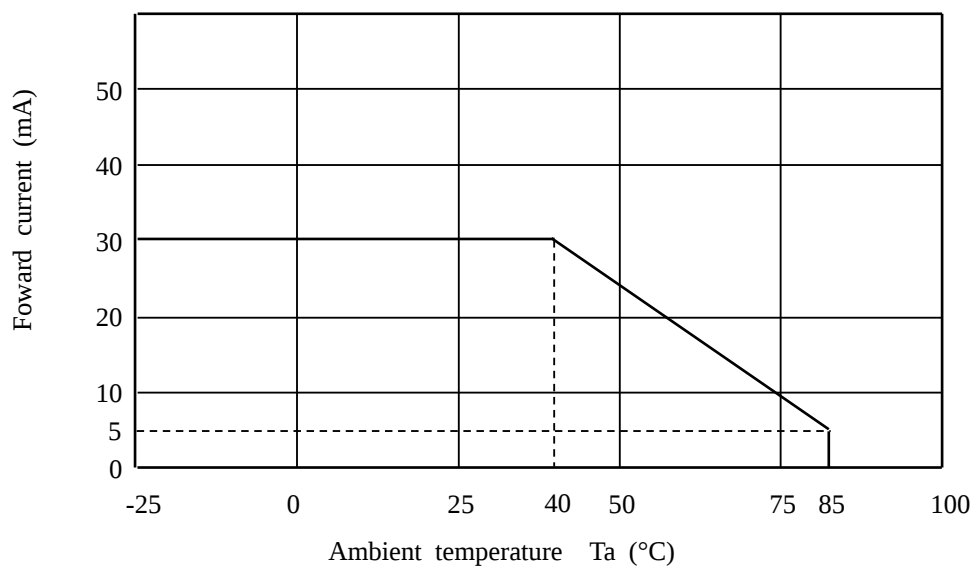
Ta=25°C

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	$I_F=20\text{mA}$	-	1.2	1.4	V
	Reverse current		I_R	$V_R=3\text{V}$	-	-	10	μA
Output	Collector dark current		I_{CEO}	$V_{CE}=20\text{V}$	-	-	100	nA
Transfer characteristics	Collector current		I_C	$V_{CE}=5\text{V}, I_F=5\text{mA}$	150	-	600	μA
	Response time	(Rise)	t_r	$V_{CE}=5\text{V}, I_C=100\mu\text{A}$ $R_L=1\text{k}\Omega$	-	50	150	μs
		(Fall)	t_f		-	50	150	μs
	Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_F=10\text{mA}, I_C=40\mu\text{A}$	-	-	0.4	V

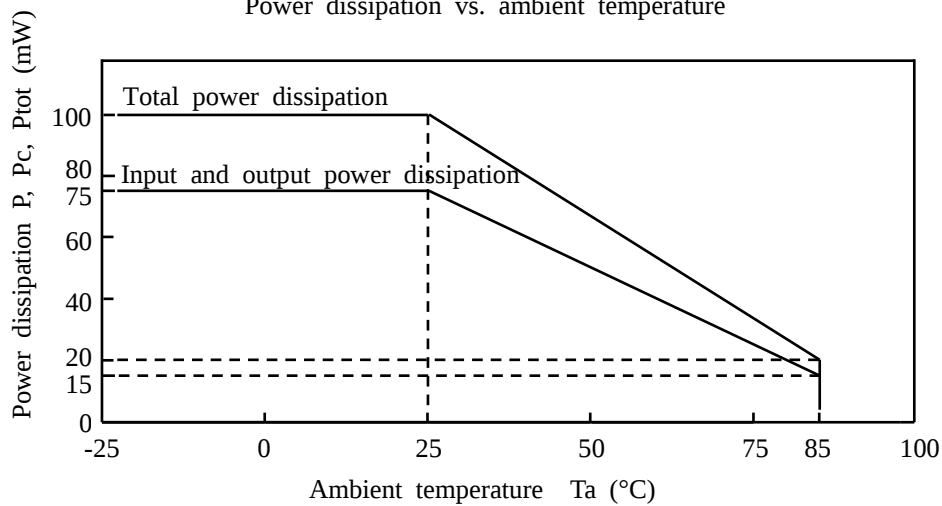
(Test circuit for response time)



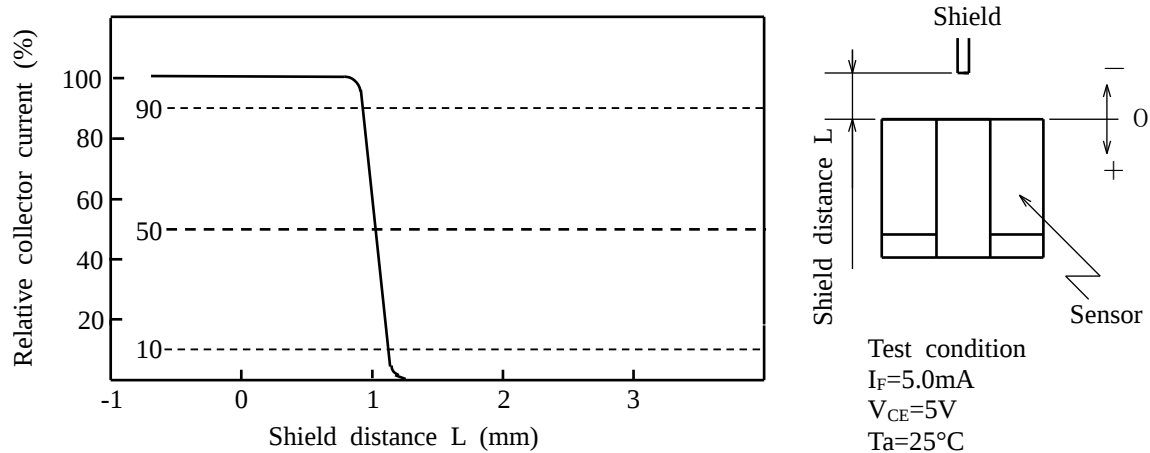
Forward current vs. ambient temperature



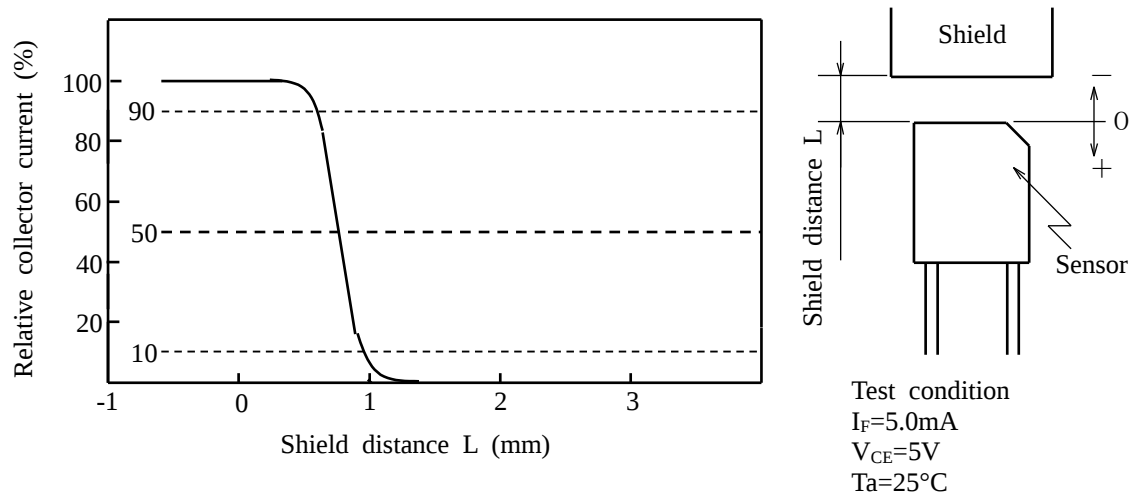
Power dissipation vs. ambient temperature



Relative collector current vs. shield distance 1 (Reference value)



Relative collector current vs. shield distance 2 (Reference value)



■Supplements

- Parts

Refer to the attached sheet, Page 8.

- Packing

Refer to the attached drawing No. CY12951i09B, Page 9.

- ODS materials

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 : CFCs, Halon, Carbon tetrachloride, 1.1.1-Trichloroethane (Methyl chloroform)

- Specified brominated flame retardants

Specified brominated flame retardants (PBB and PBDE) are not used in this device at all.

- Compliance with each regulation

- 1) The RoHS directive(2002/95/EC)

This product complies with the RoHS directive(2002/95/EC)

Object substances: mercury,lead, cadmium,hexavalent chromium,polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE)

- 2) Content of six substances specified in Management Method for Control of Pollution Caused by Electronic Information Products Regulation (Chinese : 电子信息产品污染控制管理办法) .

Category	Toxic and hazardous substances					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent chromium (Cr ⁶⁺)	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
Photointerrupter	✓	✓	✓	✓	✓	✓

✓ : indicates that the content of the toxic and hazardous substance in all the homogeneous materials of the part is below the concentration limit requirement as described in SJ/T 11363-2006 standard.

- Product mass : Approximately 24mg

- Country of origin : Japan and China

■Notes

- Circuit design

In circuit designing, make allowance for the degradation of the light emitting diode output that results from long continuous operation. (50% degradation/5 years)

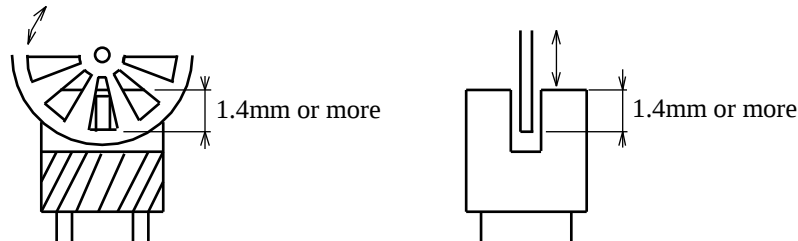
- Prevention of detection error

To prevent photointerrupter from faulty operation caused by external light, do not set the detecting face to the external light.

- Position of opaque board

Opaque board shall be installed at place 1.4mm or more from the top of elements.

(Example)



- Soldering

To solder onto lead pins, solder at the position of 0.3mm or more from the package's bottom at 260°C for 3s or less.

Please don't bend lead pins from the root of package when soldering.

Please also take care not to let any external force exert on lead pins.

Please don't do soldering with preheating, and please don't do soldering by reflow.

Please have soldering adjustment, etc. after GP1S194HCZ0F is cooled down, and also note that the outer mold resin may be meltdown by heating for a long time.

- Cleaning

Cleaning shall be carried out under the below conditions to avoid keeping solvent, solder and flux on the device.

- (1) Solvent cleaning : Solvent temperature 45°C or less, Immersion for 3min. or less
- (2) Ultrasonic cleaning : Since the influence to the product may changes by the conditions of the ultrasonic power, time, the tank size, PCB size, the product installation condition, etc., please evaluate with actual conditions and confirm before usage.
- (3) The cleaning shall be carried out with solvent below.

Solvent : Ethyl alcohol, Methyl alcohol

- Lead pin

Lead terminals of this product are tin copper alloy plated. Before usage, please evaluate solder ability with actual conditions and confirm. The uniformity in color for the lead terminals are not specified.

■Parts

This product uses the below parts.

●Light detector (Quantity : 1)

Type	Material	Maximum sensitivity (nm)	Sensitivity (nm)	Response time (μs)
Phototransistor	Silicon (Si)	930	700 to 1200	20

●Light emitter (Quantity : 1)

Type	Material	Maximum light emitting wavelength (nm)	I/O Frequency (MHz)
Infrared light emitting diode (non-coherent)	GaAs	950	0.3

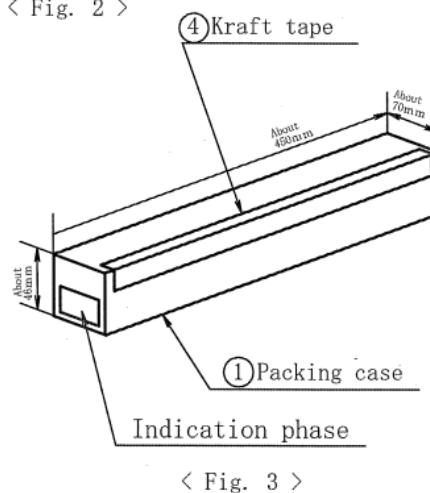
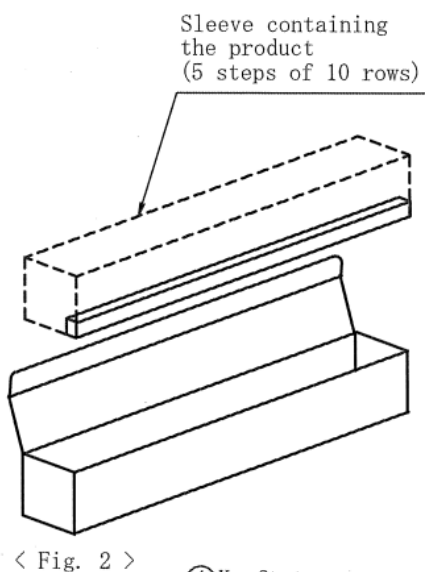
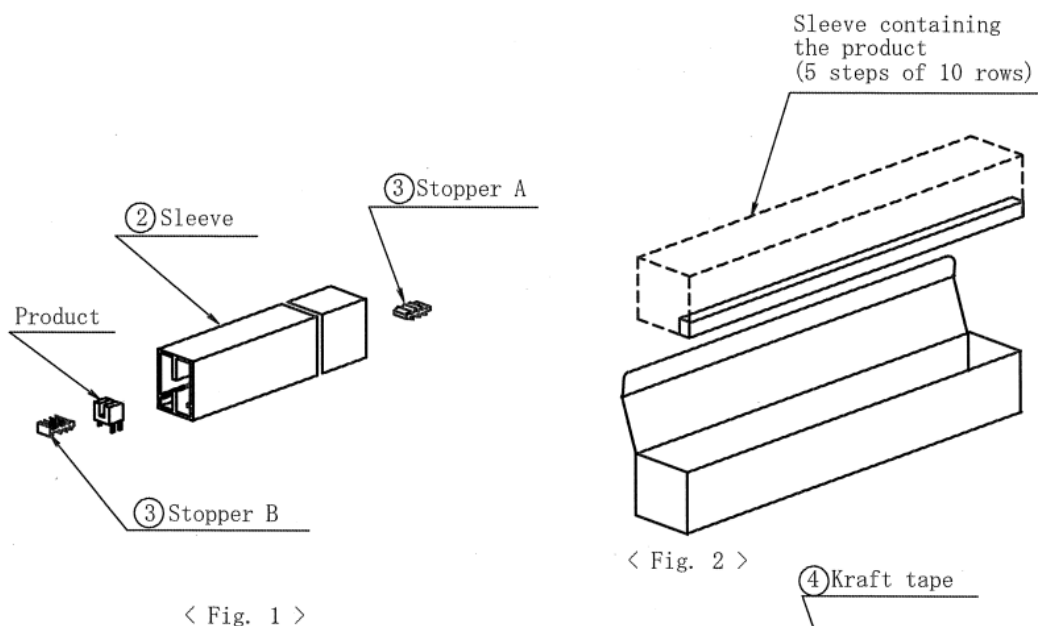
●Material

Case	Lead frame	Lead frame plating
Black PPS resin (UL 94V-0)	42 Alloy	SnCu plating

●Others

This product shall not be proof against radiation flux.

■Packing (Drawing No.:CY12951i09B)



1. Packing material

No	Name	material	The number of use
1	Packing case	Paper corrugated cardboard	1
2	Sleeve	Polycarbonate	50
3	Stopper A, B	rubber	50, respectively
4	Kraft tape	—	—

2. Packing quantity

1. Packing sleeve : 200pieces per 1 sleeve
2. Packing case : 10000pieces per 1 case
(Gross weight : Approx 850 g)

3. Indication items

The contents of the carton indication conforms to EIAJ C-3 and the following items are indicated.

Model No., Internal production control name, Quantity, Packing date, Corporate name, Country of origin

4. Packing method

1. 200 products are contained to a sleeve.
(The receipt method is shown in the above figure.) <Fig.1>
2. 50 sleeves (5 steps of 10 rows) are contained into a packing case.
<Fig.2>
3. The packing case is sealed off with the kraft tape.
Indicates on the packing case Model No., Internal production control name, Quantity, Packing date, Corporate name, Country of origin. <Fig.3>

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- Personal computers
- Office automation equipment
- Telecommunication equipment [terminal]
- Test and measurement equipment
- Industrial control
- Audio visual equipment
- Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection

with equipment that requires higher reliability such as:

- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
- Traffic signals
- Gas leakage sensor breakers
- Alarm equipment
- Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:

- Space applications
- Telecommunication equipment [trunk lines]
- Nuclear power control equipment
- Medical and other life support equipment (e.g., scuba).

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