



1. Application

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

The model list of GP1UD28YK series

| Application | Model No. | B.P.F. center frequency (TYP) |
|-------------|------------|-------------------------------|
| | GP1UD28YK | 40 kHz |
| | GP1UD280YK | 36 kHz |
| | GP1UD281YK | 38 kHz |
| | GP1UD282YK | 36.7 kHz |
| | GP1UD283YK | 32.75 kHz |
| | GP1UD287YK | 56.8 kHz |

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

2. Outline

Refer to the attached sheet, Page 8.

3. Ratings and characteristics

Refer to the attached sheet, Page 4 to 7.

4. Reliability

Refer to the attached sheet, Page 9.

5. Outgoing inspection

Refer to the attached sheet, Page 10.

6. Supplement

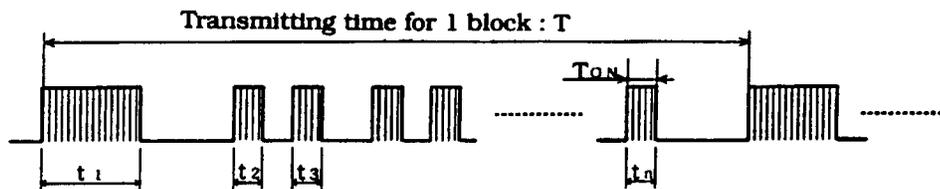
- 1) This infrared detecting unit for remote control satisfies each performance requirements in para. 3.5, in the standard optical system in Fig.2.
- 2) This product is built-in photodiode.
- 3) Production place indication of overseas production shall follow the indication in the drawing of the outline 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 PBBO₃ and PBB₃ are not used in this device at all.
- 7) Package specification : Refer to the attached sheet, Page 11.

7. Notes

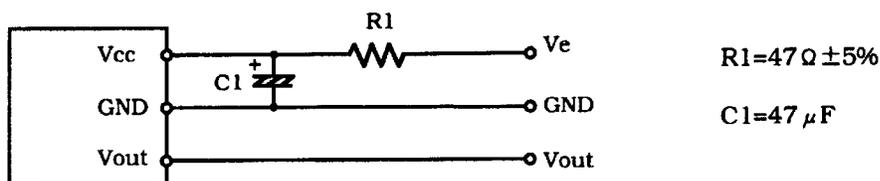
- 1) When this infrared remote control detecting unit shall be adopted for wireless remote control, please use it with the signal format of transmitter, which total duty ratio D_t (Emitting time $\sum_{N=1}^n t_N$ / Transmitting time for 1 block T) is 40% or less. ON signal time TON (Pulse width of the presence of modulated IR) should be 250 μ s 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.



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

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- 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.)

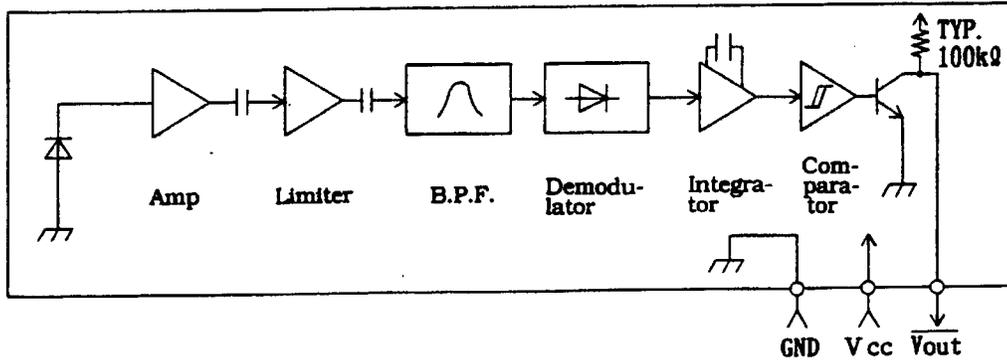


The circuit constant is a example. It is difference from mounting equipment. Please select it by your mounting equipment.

- 10) The edge of lead has possibility to bend. When the edge of lead is transformed at mounting to be impossible to insert, please mount it after adjustment.
- 11) Taken devices out, the devices are sometimes caught in the sleeve. therefore, to mount it smoothly, please consider how to take it out.

3. Ratings and characteristics

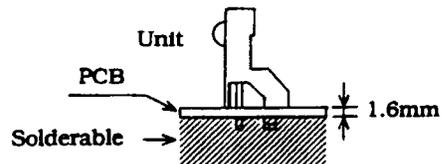
3.1 Schematic



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 PCB



3.3 Recommended operating conditions

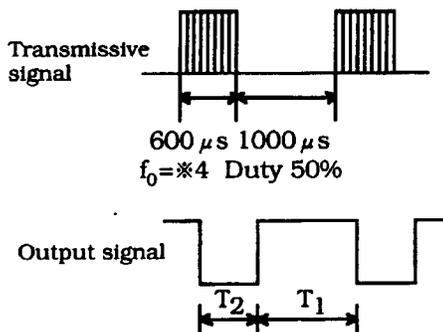
| Parameter | Symbol | Operating condition | Unit |
|----------------|--------|---------------------|------|
| Supply voltage | Vcc | 2.7 to 5.5 | V |

3.4 Electrical characteristics

(Unspecified Ta=25°C, Vcc=+3V)

| Parameter | Symbol | MIN. | TYP. | MAX. | Unit | Remark |
|---------------------------|-----------------|----------------------|------|------|------|----------------|
| Current dissipation | I _{cc} | - | - | 200 | μA | No input light |
| High level output voltage | V _{OH} | V _{cc} -0.5 | - | - | V | *3 |
| Low level output voltage | V _{OL} | - | - | 0.5 | V | *3 |
| 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 : f₀ of each model is shown in the list below.

| Model No. | B.P.F. center frequency (kHz) |
|------------|-------------------------------|
| GP1UD28YK | 40 |
| GP1UD280YK | 36 |
| GP1UD281YK | 38 |
| GP1UD282YK | 36.7 |
| GP1UD283YK | 32.75 |
| GP1UD287YK | 56.8 |

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) $E_v < 10 \ell x$, $\phi = 0^\circ$ 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) $E_v < 10 \ell x$, $\phi \leq 30^\circ$ in Fig.2.

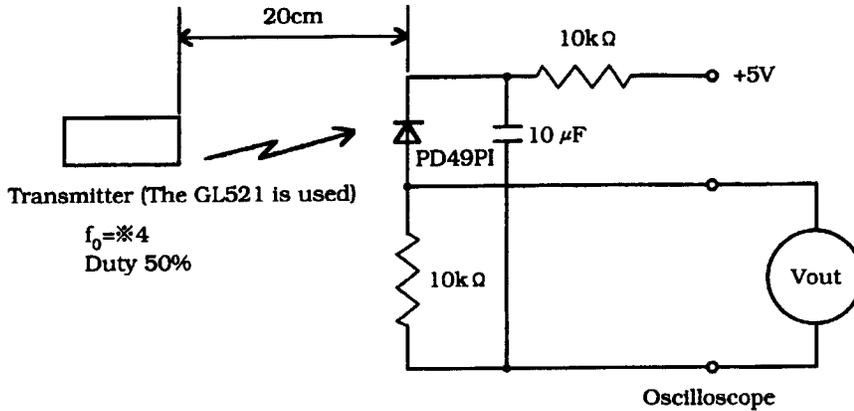
3.5.3 Characteristics of anti-outer peripheral light reception distance

The output signal shall satisfy the electrical characteristic requirements in para. 3.4 at $L=0.2$ to 5.0m , (*5, *6) $E_v \leq 300 \ell x$, $\phi = 0^\circ$ 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.

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In the figure above, the transmitter shall be set as the output $V_{out}(p-p)$ will be 40mV. Note that the PD49PI in this application is The one with short-circuit current $I_{sc} = 2.6 \mu A$ measured at $E_v = 100 \text{ lx}$. (E_v is the illuminance by CIE standard light source A (tungsten lamp)).

Fig. 1 Transmitter

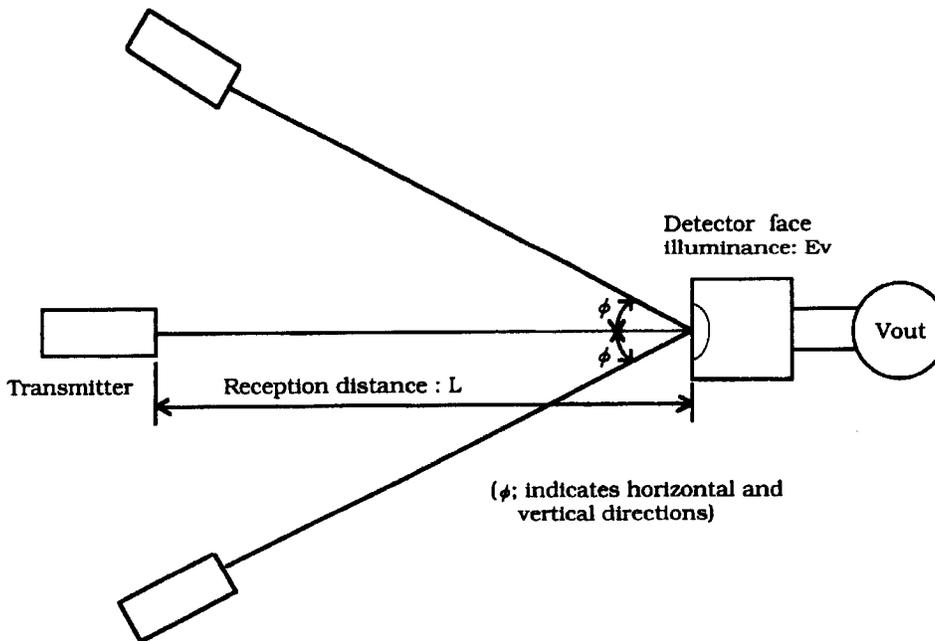
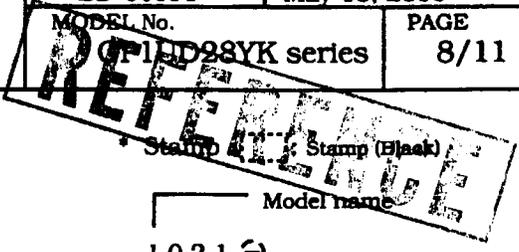
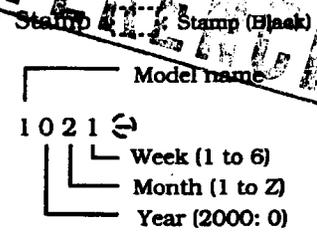


Fig.2 Standard optical system



Stamp list

| Model No. | Stamp |
|------------|---------|
| GP1UD28YK | Without |
| GP1UD281YK | 1 |
| GP1UD282YK | 2 |
| GP1UD283YK | 3 |
| GP1UD287YK | 7 |
| GP1UD280YK | 0 |

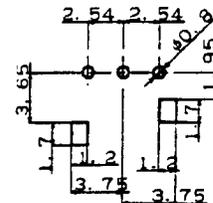
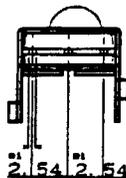
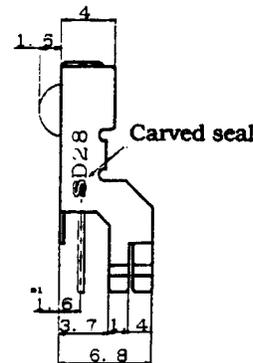
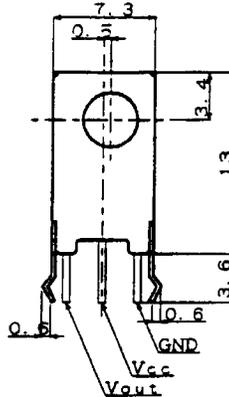
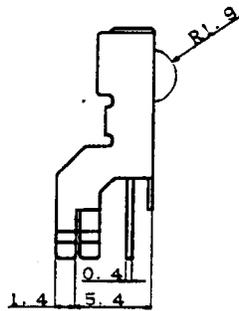
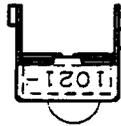
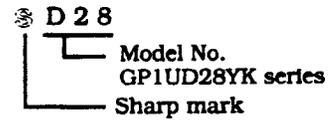


Production place list

| Lot No. | Overseas production place |
|---------|---------------------------|
| 1021 - | Philippine |

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

* Carved seal



Example of mounting drawing from solder side (Reference)

- *1 indicates root dimensions of connector.
- Unspecified tolerance : ± 0.3
- Case thickness : 0.3TYP.
- Case material : Fe
- Case finish : Solder plating (Pb10%)
- Lead material : Fe (Ag plating)
- Lead edge finish : Solder plating or solder dip
- Mold resin : Epoxy resin
- Product mass : Approx. 1.0g
- Dimensions in parenthesis are shown for reference.
- *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.)

| | | |
|---------|-------------|--------------------|
| Scale | Name | GP1UD28YK series |
| 2/1 | | Outline Dimensions |
| Unit | Drawing No. | SOD03797 |
| 1=1/1mm | | |

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4. Reliability

The reliability of products shall satisfy items listed below.

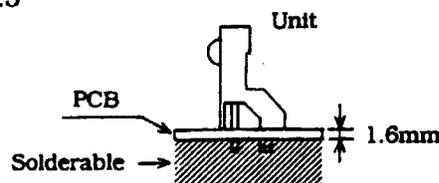
Confidence level : 90%
LTPD : 10%/20%

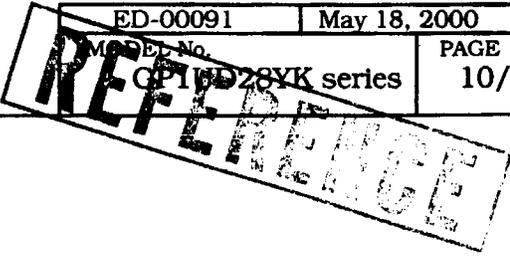
| Test Items | Test Conditions | Failure Judgement Criteria | Samples (n) Defective(C) |
|--|--|--|--------------------------|
| Terminal strength (Tension) | Weight : 5N 30s/each terminal | Performance test in para. 3.5 should not be satisfied. | n=11, C=0 |
| Terminal strength (Bending) | Weight : 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°C, 90%RH, t=240h | | n=22, C=0 |
| * High temp. storage | Ta=70°C, t=240h | | n=22, C=0 |
| * Low temp. storage | Ta=-20°C, t=240h | | n=22, C=0 |
| * Temperature cycling | 1cycle -20°C to +70°C (30min) (30min) 20cycles test | | n=22, C=0 |
| * Operation life (High temperature) | Ta=70°C, Vcc=3V, t=240h | | n=22, C=0 |
| Solder heat | 260±5°C, 5s (1.6mm at mounting on 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.

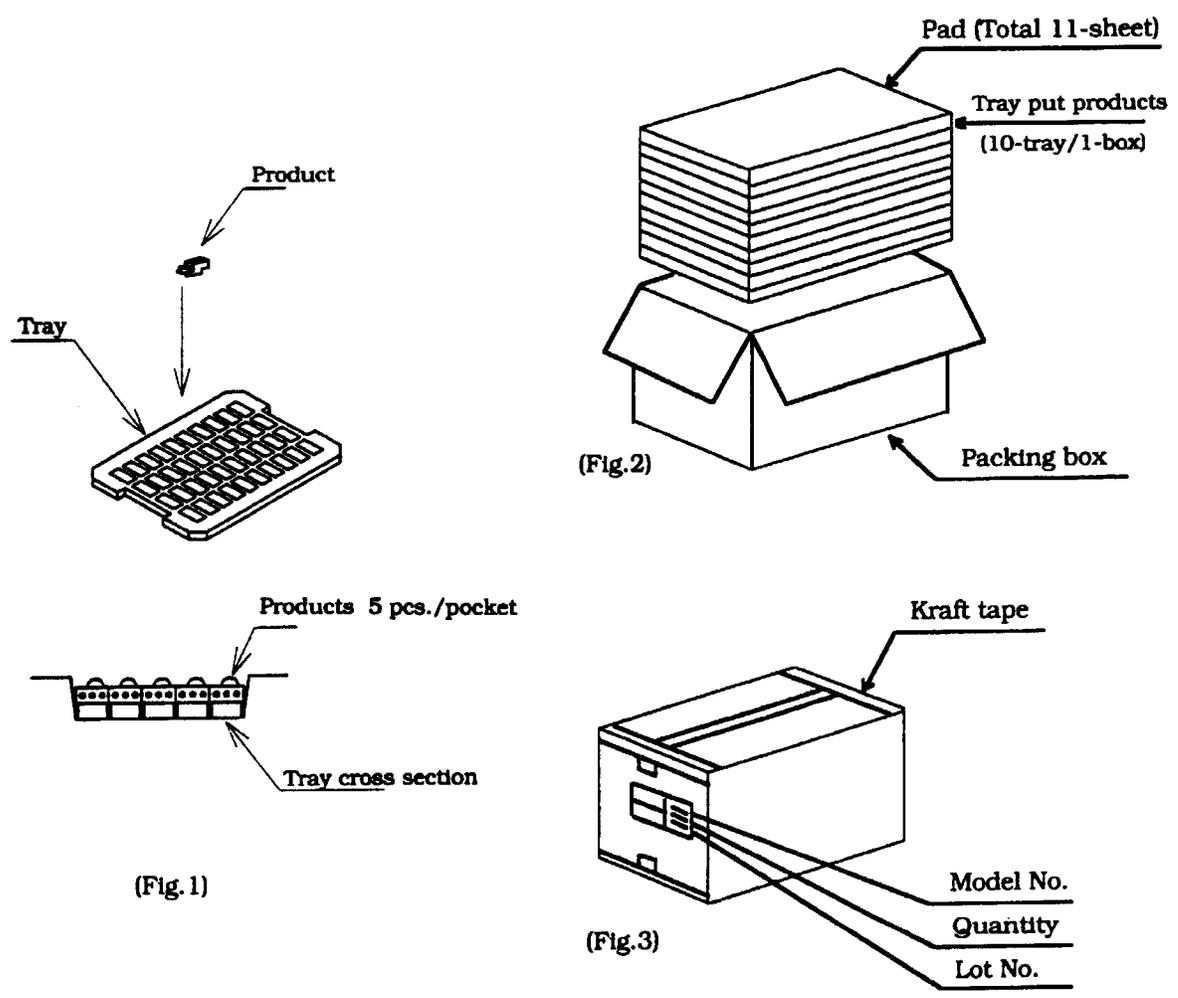
(2) Inspection method

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.) | |

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Package drawings



Packaging method

- Put products of 200pcs. in tray.
Put direction is showed in the above fig. (Fig. 1)
 - Put them (10-tray) in the packing box.
Put pads on their top and bottom, between pads. (Fig. 2)
 - Seal the packing box with kraft 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 | GPIUD28YK series Packing specification |
| / | | |
| Unit | Drawing No. | SOD03798 |
| 1= / mm | | |

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Suggested applications (if any) are for standard use; See Important Restrictions for limitations on special applications. See Limited Warranty for SHARP's product warranty. The Limited Warranty is in lieu, and exclusive of, all other warranties, express or implied. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR USE AND FITNESS FOR A PARTICULAR PURPOSE, ARE SPECIFICALLY EXCLUDED. In no event will SHARP be liable, or in any way responsible, for any incidental or consequential economic or property damage.

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