



## SPS-446 Series

### Receiver Pre-amp Module for Infrared Remote Control

#### Features

- This is an unified module consisting of a PIN photodiode and receiver pre-amp IC.  
It is a compact type, not necessary to mount outer part, and provides low voltage and low power consumption.
- It also puts a measure to inverter fluorescent lamp with a high frequency trap circuit for band-pass filter.
- It has leads at the both sides, so it is easy to put it on PCB.

#### Absolute Maximum Ratings at Ta=25°C (as per JIS C 7032)

| Parameter             | Symbol | Rating     | Unit |
|-----------------------|--------|------------|------|
| Line Voltage          | VCC    | 0 to +6.3  | V    |
| Power Dissipation     | PD     | 100        | mW   |
| Operating Temperature | Topr   | -10 to +60 | °C   |
| Storage Temperature   | Tstg   | -20 to +70 | °C   |
| Soldering Temperature | Tsol   | +260 *1    | °C   |

#### Recommended Operating Condition at Ta=25°C

| Parameter    | Symbol | Opr. Condition | Unit |
|--------------|--------|----------------|------|
| Line Voltage | VCC    | +4.7 to +5.3   | V    |

We recommend the signal format with leader code (for example ; NEC format or Home Electrical Appliances Society format in Japan) for the remote control transmitter.

#### Electrical / Optical Characteristics at Ta=25°C, VCC=5.0V D.C.

| Parameter                 | Symbol         | Condition                                                                         | Min. | Typ. | Max. | Unit |
|---------------------------|----------------|-----------------------------------------------------------------------------------|------|------|------|------|
| Consumption Current       | ICC            | Non-signal input                                                                  | –    | 2.6  | 4.0  | mA   |
| Controlling Distance      | L              | *2 On axis                                                                        | 7.5  | 9.5  | –    | m    |
|                           |                | *2 form device                                                                    |      |      |      |      |
|                           |                | Cone with its limit inclined at 30 deg to axis                                    | 5.0  | –    | –    | m    |
|                           |                | Cone with its limit inclined at 45 deg to axis                                    | 3.0  | –    | –    | m    |
| Low-level Output Voltage  | VL             | *2 At the point of 30cm on axis                                                   | –    | –    | 0.5  | V    |
| High-level Output Voltage | VH             | *2 At the point of 30cm on axis                                                   | 4.5  | –    | –    | V    |
| Low-level Pulse Width     | TWL            | *2 Specified by TWL time interval of output at the point of 30cm and 7.5m on axis | 300  | 610  | 900  | μs   |
| High-level Pulse Width    | TWH            | *2 Specified by TWH time interval of output at the point of 30cm and 7.5m on axis | 300  | 590  | 900  | μs   |
| Carrier Wave Frequency    | f <sub>o</sub> | –                                                                                 | –    | *3   | –    | kHz  |

\*1 Soldering time : with in 3sec and clearance of 1mm from lead stopper.

\*2 As shown in Fig.1, burst wave shall be transmitted by our transmitter in item 7. Detector face illuminance : E<sub>e</sub> < 10 lx

\*3 Carrier wave frequency (f<sub>o</sub>) differs every a type. Refer to the following list.

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| Type No.  | Carrier wave frequency (fo) |
|-----------|-----------------------------|
| SPS-446   | 40 kHz                      |
| SPS-446-1 | 38 kHz                      |
| SPS-446-2 | 36.7 kHz                    |
| SPS-446-3 | 33.3 kHz                    |
| SPS-446-4 | 36 kHz                      |
| SPS-446-6 | 56.8 kHz                    |

### Precautions of Use      ▲Precautions

- (1) Care must be taken to avoid bending leads.
- (2) Do not apply any force or mechanical stress onto the leads or plastic part during soldering.
- (3) Confirm reliability in terms of devices, because it sometimes acts be wrong by the ingredient of the ripple noise of the power supply lines.

Please design the ripple voltage of the power supply line below 1mVp-p.

Please attach the RC filter ( $R=100\Omega$ ,  $C=22\mu F$ ) for the power supply lines.

### Pulse Waveform

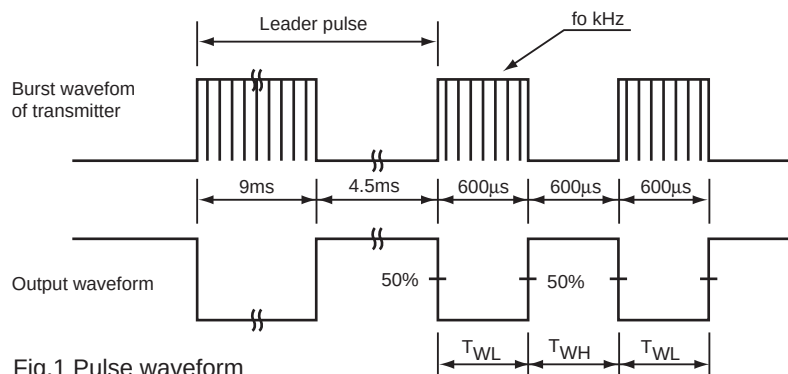


Fig.1 Pulse waveform

### Transmitter

The Transmitter shall be defined by adjusting the output of transmitter to make  $V_o=400mVp-p$  according to the burst wave shown in Fig. 1 and measurement condition shown in Fig.2. In addition infrared LED used in the transmitter is set to  $\lambda_{peak}=945nm$ ,  $\Delta\lambda=45nm$ , and photodiode used in the receiver is set to  $32nA / I_x$  ( $V_R=5.0V$ ).

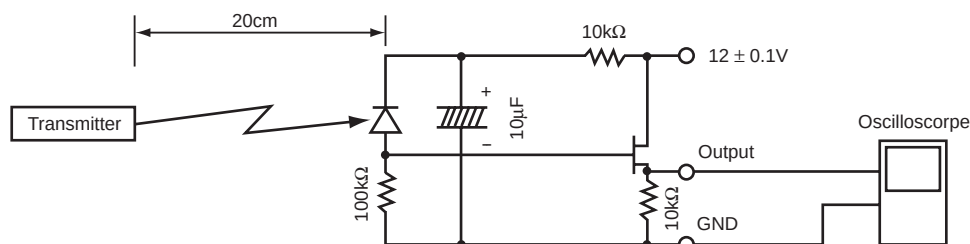


Fig.2 The output adjustment of transmitter

## Measurement Condition

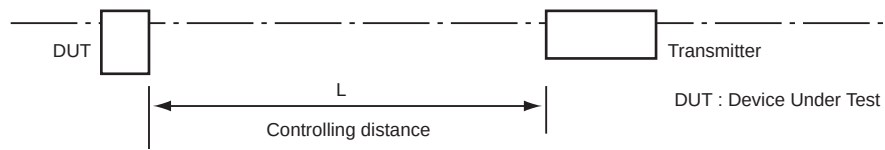


Fig.3 Measurement Condition

## Block Diagram

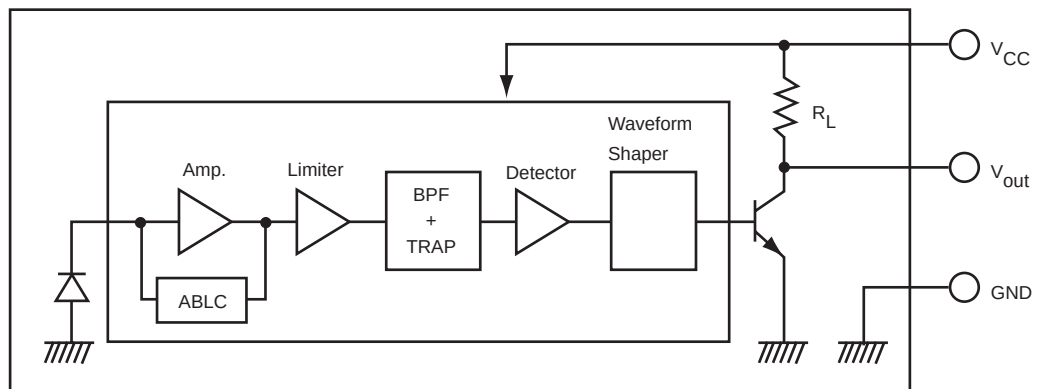
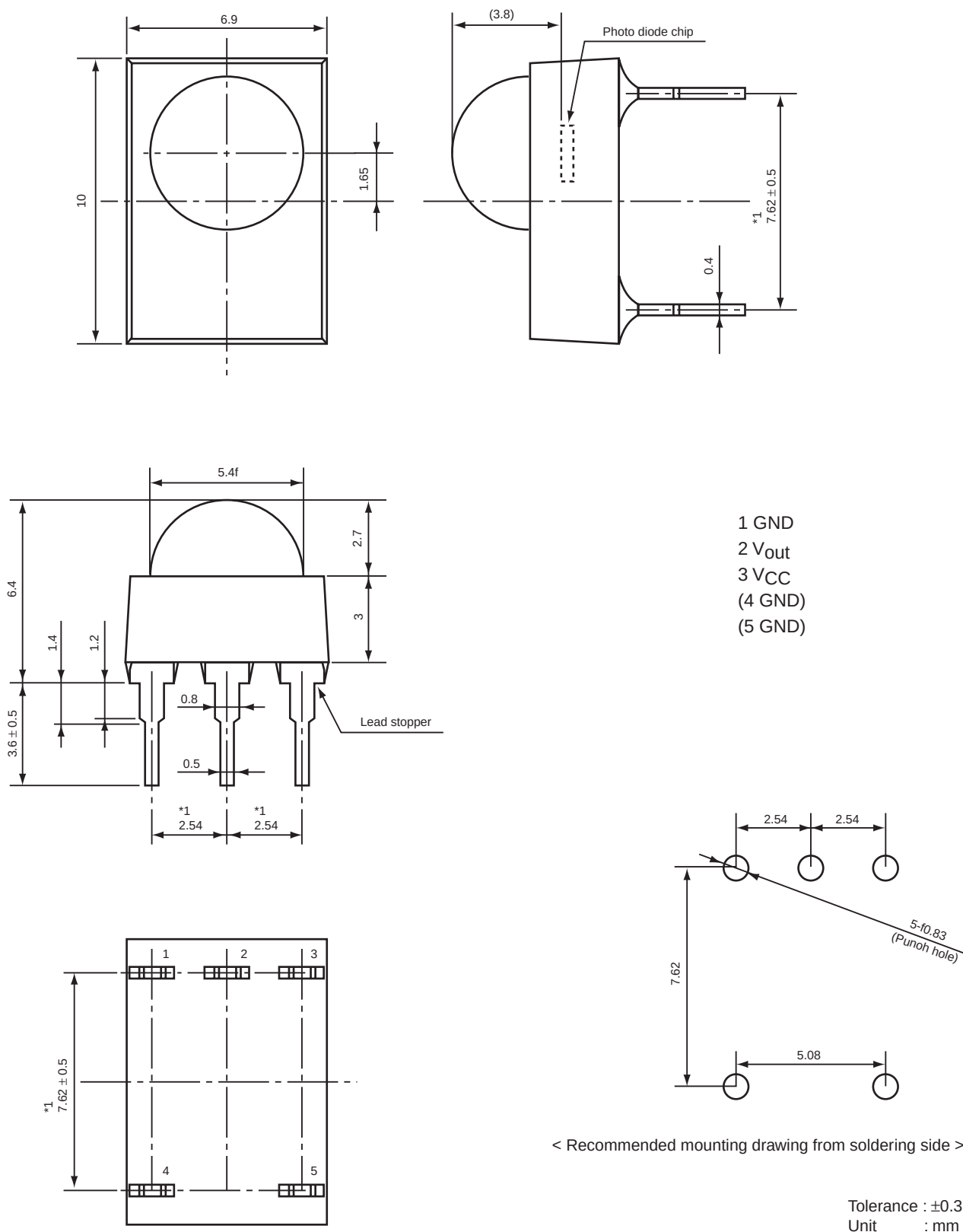


Fig.4 Block Diagram

- Note
1.  $V_{out}$  : Active "Low" output
  2.  $R_L \approx 15k\Omega$  to  $51k\Omega$
  3. The power supply filter is not being attached.

## SPS-446 Series

SPS-446 Series Package Dimensions and Pinconnection



- Note
- 1) Pin4, Pin5 has been connected to Pin1 (GND) in a product.
  - 2) \*1 indicates root dimensions of lead.
  - 3) The photo diode chip is located in 3.8mm distance from top of the lense.



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### Precautionary instructions in handling gallium arsenic products

Special precautions must be taken in handling this product because it contains, gallium arsenic, which is designated as a toxic substance by law. Be sure to adhere strictly to all applicable laws and regulations enacted for this substance, particularly when it comes to disposal.

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