GP1U10X Series

Compact, Surface Mount and Reflow Soldering Type IR Detecting Unit for Remote Control

■ Features

1. Compact and surface mount type
   (Mounting area : 4/5 compared with **GP1U90X**)
2. Reflow soldering type (240 ˚C, for 5 seconds or less)
3. Power filter capacitor and resistance are not required any more as a result of adoption of built-in constant voltage circuit
4. Various B.P.F. (Band Pass Frequency) frequency to meet different user needs

■ Applications

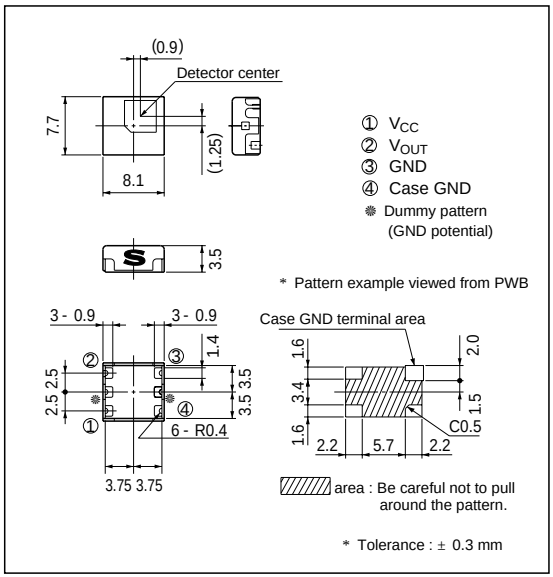
1. Camera-integral VCRs
2. Mini components

■ Package Style

Taped model on ϕ 330-mm reel (1500 pieces)

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta=25˚C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	0 to 6.3	V
*1Operating temperature	T_{opr}	- 10to+ 70	˚C
Storage temperature	T_{stg}	- 20to+ 70	˚C
*2Reflow soldering temperature	T_{sol}	240	˚C

*1 No dew condensation is allowed.
*2 Reflow soldering time : For 5 seconds

■ Recommended Operating Conditions

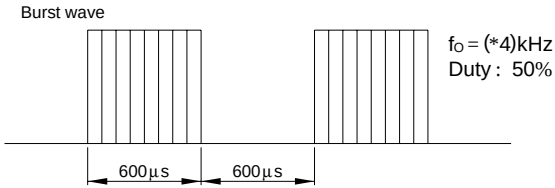
Parameter	Symbol	Operating conditions	Unit
Supply voltage	V_{CC}	4.7 to 5.3	V

■ Electro-optical Characteristics

(Ta=25˚C, Vcc=+5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Dissipation current	I_{CC}	No input light	-	-	5.0	mA
High level output voltage	V_{OH}	*3	V_{CC} - 0.5	-	-	V
Low level output voltage	V_{OL}		-	-	0.45	V
High level pulse width	T_1		400	-	800	μs
Low level pulse width	T_2		400	-	800	
*4 B.P.F. center frequency	f_O	-	-	*4	-	kHz

*3 The burst wave as shown in the following figure shall be transmitted by the transmitter shown in Fig. 1.
The carrier frequency of the transmitter, however, shall be same as *4, and measurement shall be taken of the 100th and subsequent pulses after start of transmission.
*4 The B.P.F. center frequency fo varies with model, as shown in ■ **Model Line-ups**.



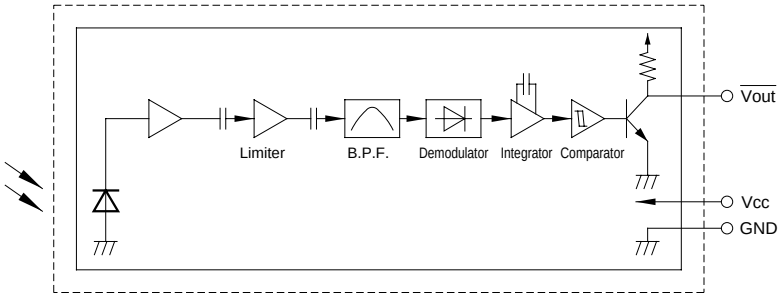
■ Model Line-ups

Diversified models with a different B.P.F. frequency are also available.

B.P.F. center frequency	Model No.	Unit
40	**GP1U10X**	kHz
36	*	
38	**GP1U101X**	
36.7	**GP1U102X**	
32.75	*	
56.8	**GP1U107X**	

* Also available on request

■ Internal Block Diagram



■ Performance

Using the transmitter shown in Fig. 1, the output signal of the light detecting unit is good enough to meet the following items in the standard optical system in Fig. 2.

(1) Linear reception distance characteristics

When L=0.2 to 8 m, Ee*5 < 10 lx and ϕ =0° in Fig. 2, the output signal shall meet the electrical characteristics in the attached list.

(2) Sensitivity angle reception distance characteristics

When L=0.2 to 6 m, Ee*5 < 10 lx and ϕ =30° in Fig. 2, the output signal shall meet the electrical characteristics in the attached list.

(3) Anti outer peripheral light reception distance characteristics

When L=0.2 to 4 m, Ee*6 <= 300 lx and ϕ =0° in Fig. 2, the output signal shall meet the electrical characteristics in the attached list.

*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 perpendicular axis at the detector face center.

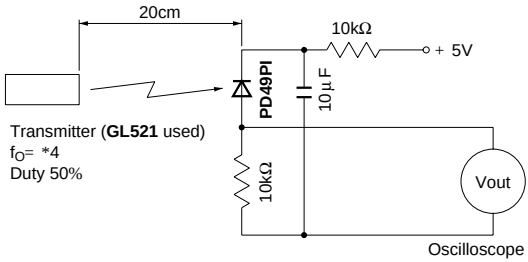


Fig. 1 Transmitter

In the above figure, the transmitter should be set so that the output V_{out} can be $52mV_{P-P}$.
However, the **PD49PI** to be used here should be of the short-circuit current I_{SC} =2.6μA at E_V=100 lx.
(E_V is an illuminance by CIE standard light source A (tungsten lamp).)

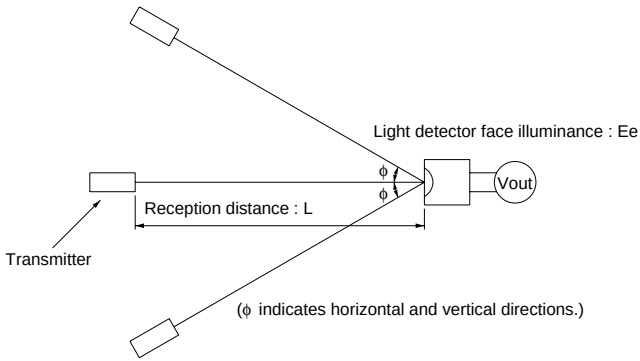


Fig. 2 Standard optical system

Fig. 1 B.P.F. Frequency Characteristics (TYP.)

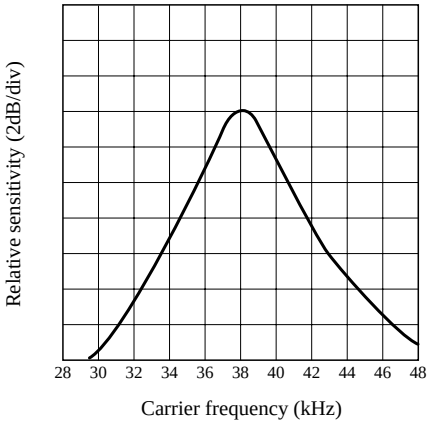


Fig. 2 Sensitivity Angle (Horizontal Direction) Characteristics (TYP.) for Reference

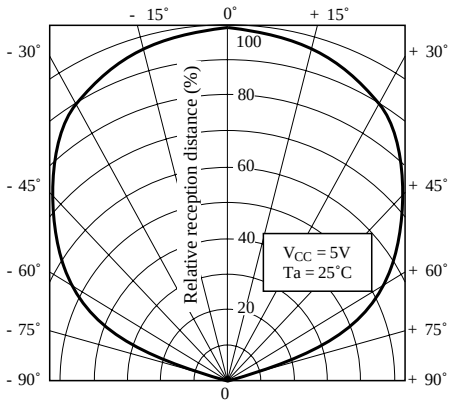


Fig. 3 Sensitivity Angle (Vertical Direction) Characteristics (TYP.) for Reference

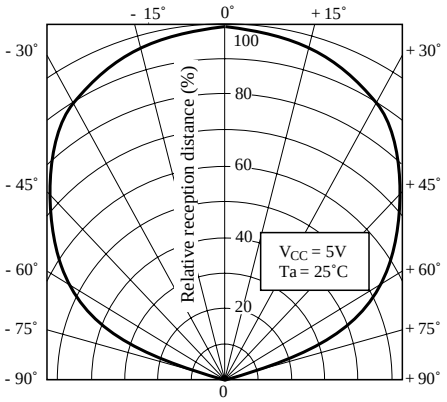


Fig. 4 Relative Reception Distance vs. Ambient Temperature (TYP.) for Reference

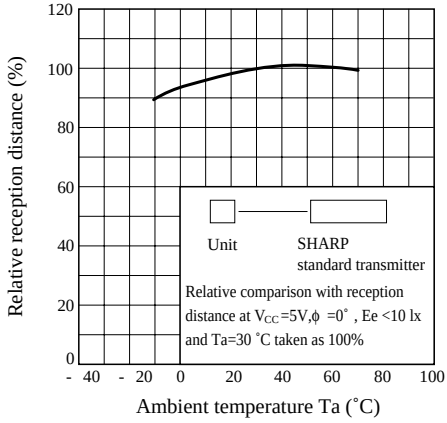


Fig. 5 AEHA (Japan Association of Electrical Home Appliances) Code Pulse Width Characteristics (1st Bit) (TYP.) for Reference

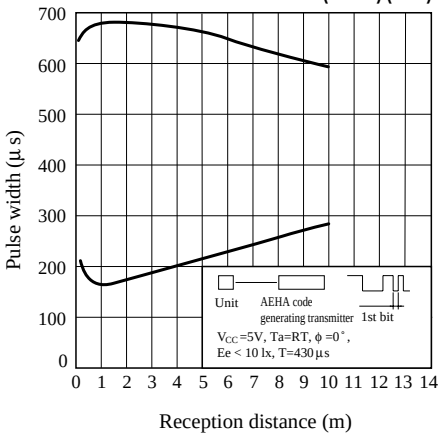
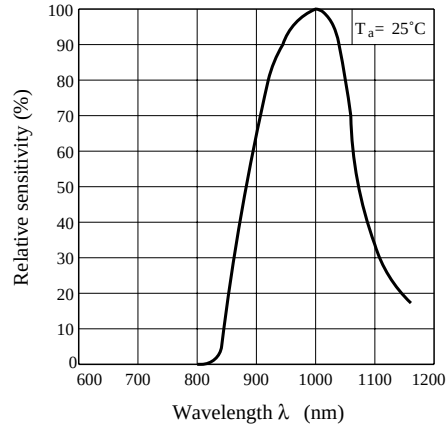


Fig. 6 Spectral Sensitivity for Reference



■ Precautions for Operation

1) In case of adopting the infrared light detecting unit for the wireless remote control, use it in accordance with the transmission scheme and the signal format recommended in "Countermeasures for malfunction prevention of home appliances with remote control" issued from Japan Association of Electrical Home Appliances (AEHA) in July, 1987.
   Use of a transmission scheme and a signal format different from those recommended may cause malfunction of home appliances.
   (Example : signal format without leader signal, bit structure of small duty ratio ($T_H/(T_H+T_L)$))
2) Use the light emitting unit (remote control transmitter), in consideration of performance, characteristics, operating conditions of light light emitting device and the characteristics of the light detecting unit.
3) Pay attention to a malfunction of the light detecting unit when the surface is stained with dust and refuse.
   Care must be taken not to touch the light detector surface.
   If it should be dirty, wipe off such dust and refuse with soft cloth so as to prevent scratch. In case some solvents are required, use methyl alcohol, ethyl alcohol or isopropyl alcohol only.
   Also, protect the light detecting unit against flux and others, since their deposition on the unit inside causes reduction of the function, fading of markings such as the part number.
4) The shield case should be grounded on PWB pattern.
   (The area across the shield case and the GND terminal is internally conductive in some cases and non-conductive in some other cases.)
5) Do not apply unnecessary force to the terminal and the case.
6) Do not push the light detector surface (photodiode) from outside.
7) To avoid the electrostatic breakdown of IC, handle the unit under the condition of grounding with human body, soldering iron, etc.
8) Do not use hole and groove set in the case of the light detecting unit for other purposes, since they are required to maintain the specified performance.

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