GP1UM26RK/GP1UM27RK Series GP1UM28RK/GP1UM28QK Series

Anti Electromagnetic Induction Noise Type Compact IR Detecting Unit for Remote Control

■ Features

1. Anti electromagnetic induction noise type.
2. Compact (case volume).
3. Various B.P.F. (Band Pass Frequency) frequency to meet different user needs.

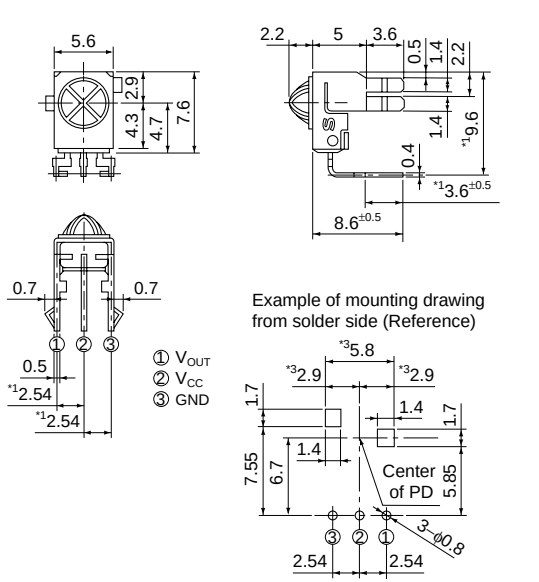
■ Applications

1. AV equipments
2. Home appliances

■ Outline Dimensions

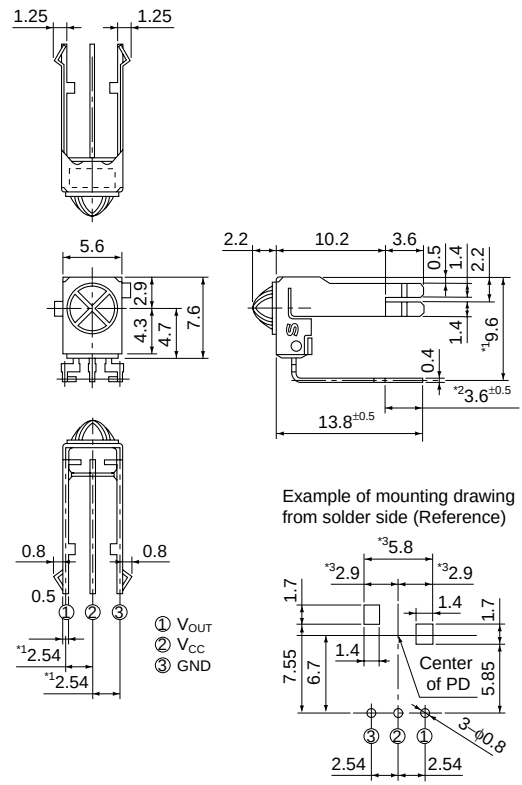
(Unit : mm)

GP1UM26RK Series



1.*1 : Indicates root dimensions of connector.
2.Unspecified tolerance : ±0.3
3.Case thickness : 0.3TYP
4.*2 : Exclude sagged solder
5.*3 : If there are difficulties to insert the **GP1UM26RK** series on PCB, we recommend to expand +0.1mm from original 2.9mm.

GP1UM27RK Series



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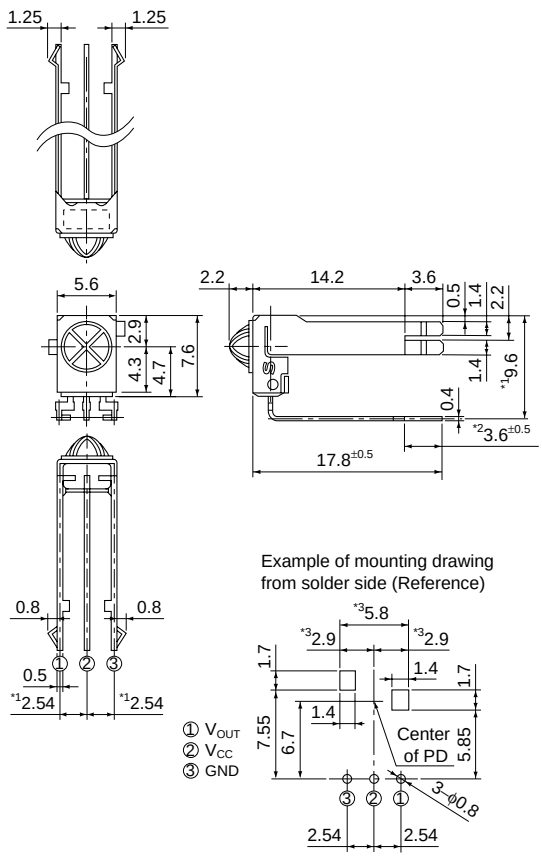
2.Unspecified tolerance : ±0.3
3.Case thickness : 0.3TYP
4.*2 : Exclude sagged solder
5.*3 : If there are difficulties to insert the **GP1UM27RK** series on PCB, we recommend to expand +0.1mm from original 2.9mm.

■ Outline Dimensions

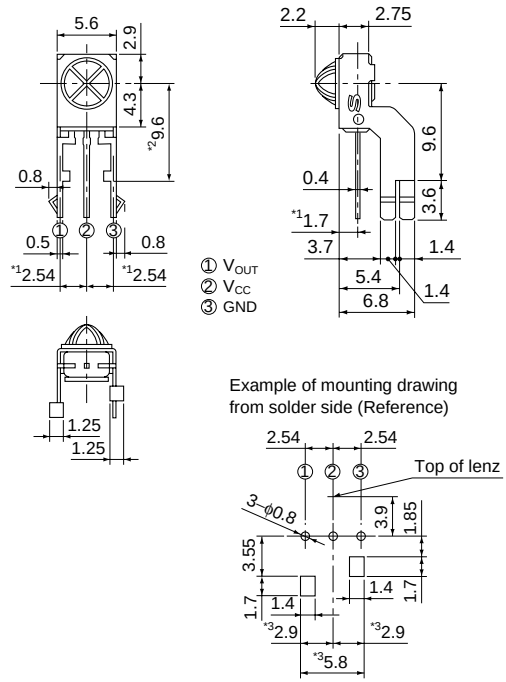
(Unit : mm)

GP1UM28RK Series



1.*1 : Indicates root dimensions of connector.
2.Unspecified tolerance : ±0.3
3.Case thickness : 0.3TYP
4.*2 : Exclude sagged solder
5.*3 : If there are difficulties to insert the **GP1UM28RK** series on PCB, we recommend to expand +0.1mm from original 2.9mm.

GP1UM28QK Series



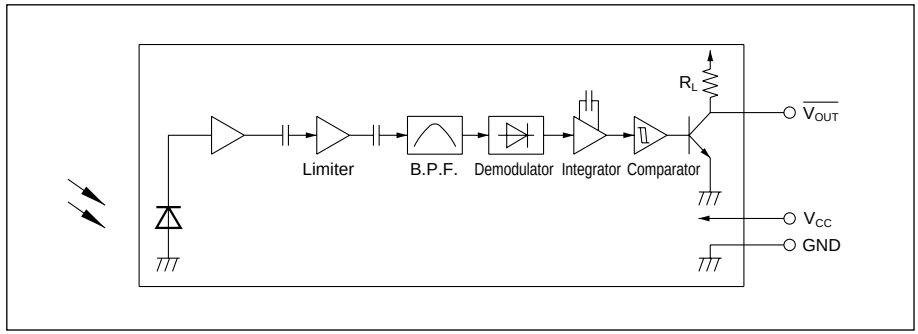
1.*1 : Indicates root dimensions of connector.
2.Unspecified tolerance : ±0.3
3.Case thickness : 0.3TYP
4.*2 : Exclude sagged solder
5.*3 : If there are difficulties to insert the **GP1UM28QK** series on PCB, we recommend to expand +0.1mm from original 2.9mm.

■ Model Line-up

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

B.P.F. center frequency	Model No.				Unit
40	**GP1UM26RK**	**GP1UM27RK**	**GP1UM28RK**	**GP1UM28QK**	kHz
36	**GP1UM260RK**	**GP1UM270RK**	**GP1UM280RK**	**GP1UM280QK**	
38	**GP1UM261RK**	**GP1UM271RK**	**GP1UM281RK**	**GP1UM281QK**	
36.7	**GP1UM262RK**	**GP1UM272RK**	**GP1UM282RK**	**GP1UM282QK**	
56.8	**GP1UM267RK**	**GP1UM277RK**	**GP1UM287RK**	**GP1UM287QK**	

■ Internal Block Diagram



■ Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	0 to +6.0	V
*1 Operating temperature	T_{opr}	−10 to +70	°C
Storage temperature	T_{stg}	−20 to +70	°C
*2 Soldering temperature	T_{sol}	260	°C

*1 No dew condensation is allowed
*2 For 5s (At mounting on PCB with thickness of 1.6mm)

■ Recommended Operating Conditions

Parameter	Symbol	Operating conditions	Unit
Supply voltage	V_{CC}	4.5 to 5.5	V

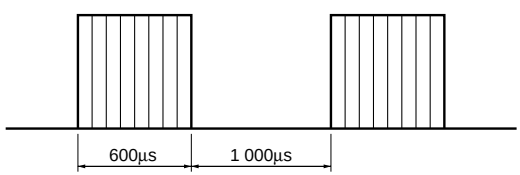
■ Electro-optical Characteristics

(T_a=25°C, V_{CC}=+5V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Dissipation current	I_{CC}	No input light	–	0.95	1.5	mA
High level output voltage	V_{OH}		V_{CC} −0.5	–	–	V
Low level output voltage	V_{OL}	*3 I_{OL}=1.6mA	–	–	0.45	V
High level pulse width	T_1		600	–	1 200	µs
Low level pulse width	T_2		400	–	1 000	µs
B.P.F. center frequency	f_0	–	–	*4	–	kHz
Output pull-up resistance	R_L	–	70	100	130	kΩ

*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 from just after starting the transmission until 50 pulse
*4 The B.P.F. center frequency f_0 varies with model, as shown in ■ **Model Line-up**

Burst wave



f_0=(*4)
Duty 50%

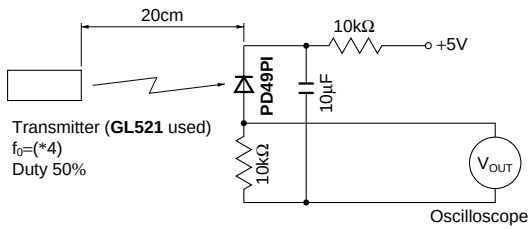
■ Performance

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 8.5(7.0)*7m, *5E_V<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 6.0(4.5)*7m, *5E_V<10 lx and $\phi \leq 30°$ 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 4.0(3.0)*7m, *6$E_V \leq$ 300 lx and ϕ=0° in Fig.2, the output signal shall meet the electrical characteristics in the attached list.

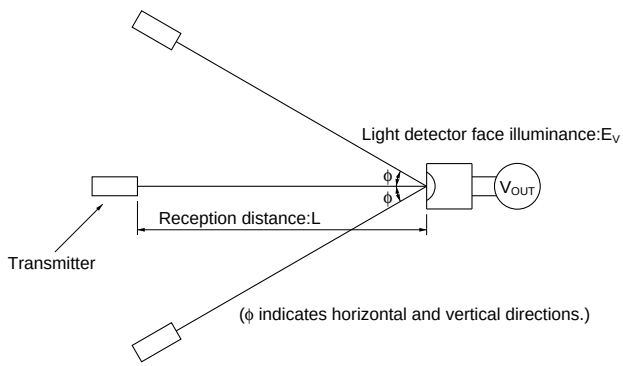
*5 It refers to detector face illuminance
*6 Outer peripheral light source: CIE standard light source A shall be used and placed at 45° from perpendicular axis at the detector face center
*7 In case of B.P.F. center frequency: 56.8kHz model

Fig.1 Transmitter



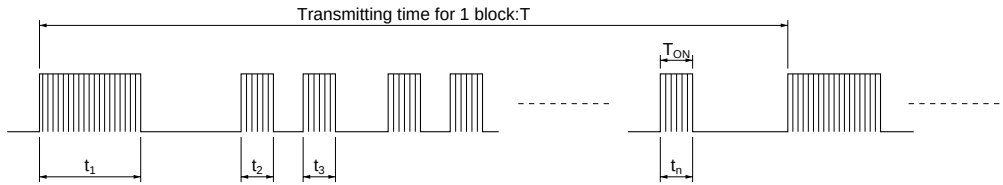
In the above figure, the transmitter should be set so that the output $V_{OUT\ (P\text{-}P)}$ can be 40mV.
However, the **PD49PI** to be used here should be of the short-circuit current I_{SC}=2.6μ A at E_V =100 lx.
(E_V is an illuminance by CIE standard light source A (tungsten lamp).)

Fig.2 Standard Optical System



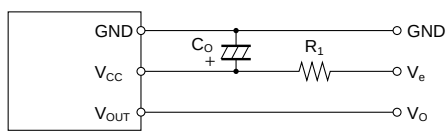
■ Precautions for Operation

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(200:In case of B.P.F. center frequency:56.8kHz model)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.



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

2. Use the light emitting unit (remote control transmitter), in consideration of performance, characteristics, operating conditions of 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 PCB 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.
9. External Circuit Examples (Mount the outer parts as near the unit as possible).



(Circuit parameters)
R_1=47Ω±5%
C_1=47μF

In setting R_1 and C_1, use suitable values after considering under the real condition
The circuit constant is a example. It is difference from mounting equipment. Please select it by your mounting equipment. This device has a transistor as protection element between V_{CC} and GND to improve anti-static electricity proof.
Please be carefully not to apply exceeding the absolute maximum ratings of applying voltage and continuous high voltage spike noise because there is cases that transistor will be short by secondary breakdown generally.
In order to do difficultly, Please add CR filter (47Ω (1/10W), 10μF or more) such as external circuit example above near V_{CC}.

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.
12. In case that this product is kept in high humidity condition, it may be hard to solder, please be careful enough about storage method.
    Depend on the flux you select, there are different solderabilities, so please select a suitable flux and use it.
13. Please use this device away from the dew drop.
    Be aware that the dew drop rusts shield case and others, may affect the electric characteristics.

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