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# GP2W0110YPS

## IrDA Transceiver Module Compliant with IrDA1.2 Low Power

### ■ Features

1. Compliant with IrDA1.2 low power
2. Integrated package of transmitter/receiver.
   (7.9×2.85×height 2.15mm)
3. General purpose
4. Low dissipation current due to shut-down function
   (Dissipation current at shut-down mode:Max. 0.1μA)
5. Soldering reflow type
6. Shield type

### ■ Applications

1. Cellular phones, PHS
2. Personal information tools

### ■ Absolute Maximum Ratings

($T_a$=25°C)

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | 0 to 6.0 | V |
| LED Supply voltage | $V_{LEDA}$ | 0 to 7.0 | V |
| *1 Peak forward current | $I_{FM}$ | 60 | mA |
| Operating temperature | $T_{opr}$ | –40 to +85 | °C |
| Storage temperature | $T_{stg}$ | –40 to +85 | °C |
| *2 Soldering temperature | $T_{sol}$ | 240 | °C |

*1 Pulse width 78.1μs, Duty ratio:3/16
*2 For MAX. 10s

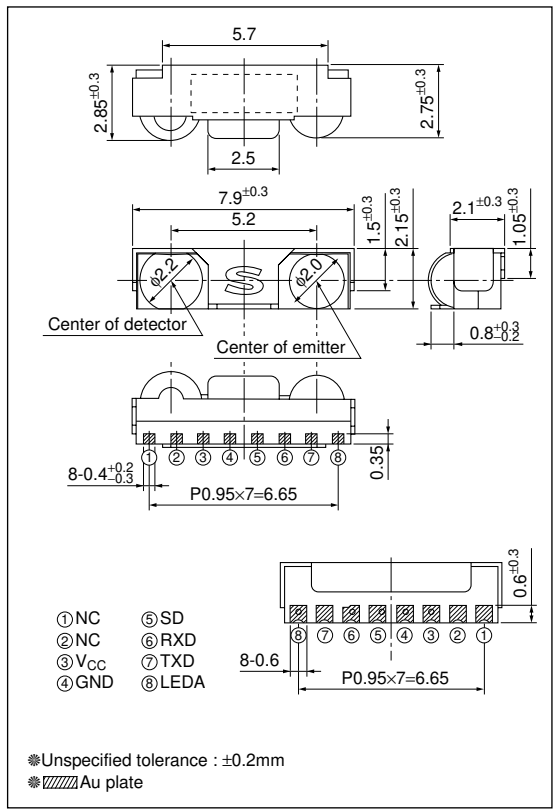
### ■ Recommended Operating Conditions

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Supply voltage | $V_{CC}$ | 2.0 to 3.6 | V |
| Transmission rate | BR | 2.4 to 115.2 | kb/s |
| High level input voltage (SD terminal) | $V_{IHSD}$ | $V_{CC}$×0.67 to $V_{CC}$ | V |
| Low level input voltage (SD terminal) | $V_{ILSD}$ | 0 to $V_{CC}$×0.1 | V |
| *3 High level input voltage (TXD) | $V_{IHTXD}$ | $V_{CC}$×0.8 to $V_{CC}$ | V |
| *3 Low level input voltage (TXD) | $V_{ILTXD}$ | 0 to $V_{CC}$×0.2 | V |
| LED Supply Voltage | $V_{LEDA}$ | 2.0 to 6.0 | V |

*3 Refer to Fig.8

### ■ Outline Dimensions

(Unit : mm)



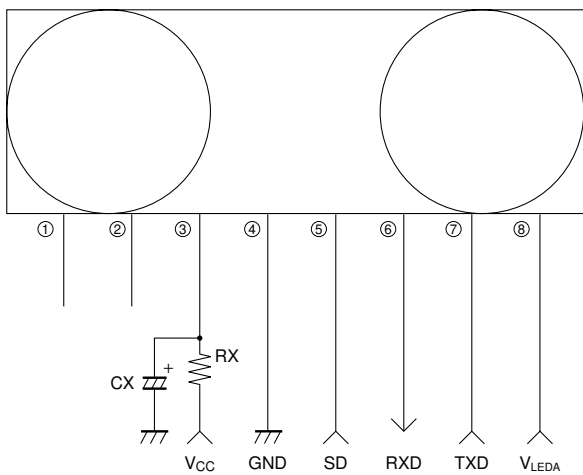
## ■ Electrical Characteristics

($T_a$=25°C, $V_{CC}$=3.3V)

| | Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|---|
| Receiver side | Dissipation current at no input signal | $I_{CC}$ | No input light, output terminal open, $V_{ILSD}$=0V | – | 90 | 120 | μA |
| | S/D dissipation current | $I_{CC-S}$ | $V_{CC}$=3.3V, $V_{IHSD}$=$V_{CC}$–0.5, No input light output terminal open | – | 0.001 | 0.1 | μA |
| | High level output voltage | $V_{OH}$ | $I_{OH}$=–200μA *4 | $V_{CC}$–0.4 | – | – | V |
| | Low level output voltage | $V_{OL}$ | $I_{OL}$=200μA *4 | – | – | 0.45 | V |
| | Low level pules width | $t_w$ | BR=115.2kb/s *4, ϕ≤15° | 1.28 | – | 6.0 | μs |
| | Rise time | $t_r$ | BR=115.2kb/s *4, $C_L$=10pF | – | – | 0.06 | μs |
| | Fall time | $t_f$ | BR=115.2kb/s *4, $C_L$=10pF | – | – | 0.06 | μs |
| | Maximum communication distance | L | $V_{OH}$, $V_{OL}$, tw, tr, tf *4 shall be satisfied at ϕ≤15° | 21 | – | – | cm |
| Transmitter side | Radiant intensity | $I_E$ | BR=115.2kb/s, ϕ≤15°, $V_{IHTXD}$=2.8V *5 | 4.0 | – | 25 | mW/sr |
| | Peak emission wavelength | $\lambda_p$ | | 850 | 870 | 900 | nm |

*4 Refer to Fig.4, 5, 6
*5 Refer to Fig.7, 8, 9

## Fig.1 Recommended External Circuit




① NC
② NC
③ $V_{CC}$
④ GND
⑤ SD
⑥ RXD
⑦ TXD
⑧ LEDA

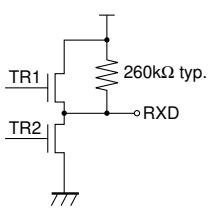
| Components | Recommended values |
|---|---|
| CX | 1μF/6.3V (Note) |

(Note) Please choose the most suitable CX according to the noise level and noise frequency of power supply.
Depend on noise level and noise frequency of power supply, CX does not work well.
There are cases that some pulse noises from RXD other than signal will occur in certain communication area. Please check by finish product that there are no problem at all communication area and data rate.
If there are any problem, please check by inserting RX (1 to 10Ω) in the circuit drawing.
Pin ① and ② are not connected internally.

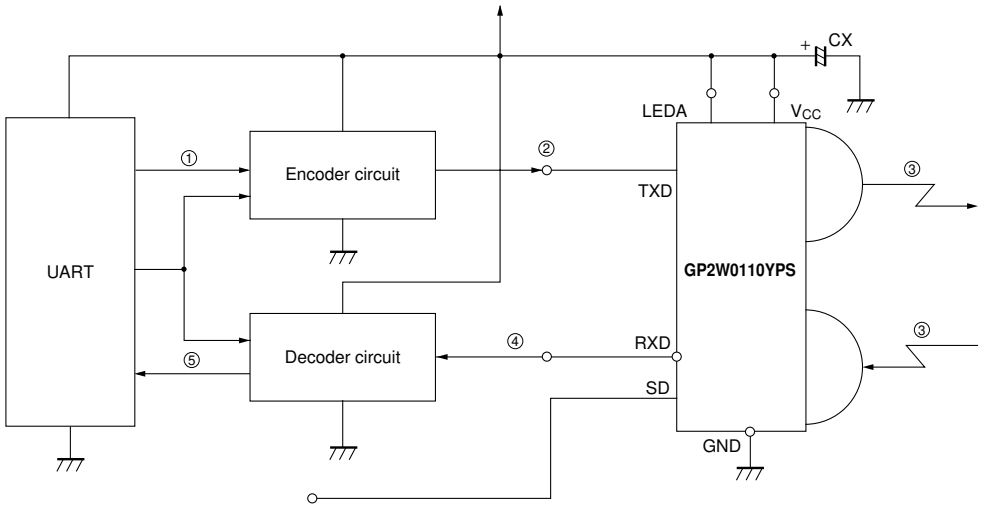
∗I/O Truth table

| SD | TXD | LED | Receiver | TR1 | TR2 | RXD |
|---|---|---|---|---|---|---|
| Low | High | ON | Don't care | – | – | Not valid |
| | Low | OFF | IrDA signal | OFF | ON | Low |
| | | | No signal | ON | OFF | High |
| High | Don't care | OFF | Don't care | OFF | OFF | Pull-up |

∗RXD Eruivalent circuit

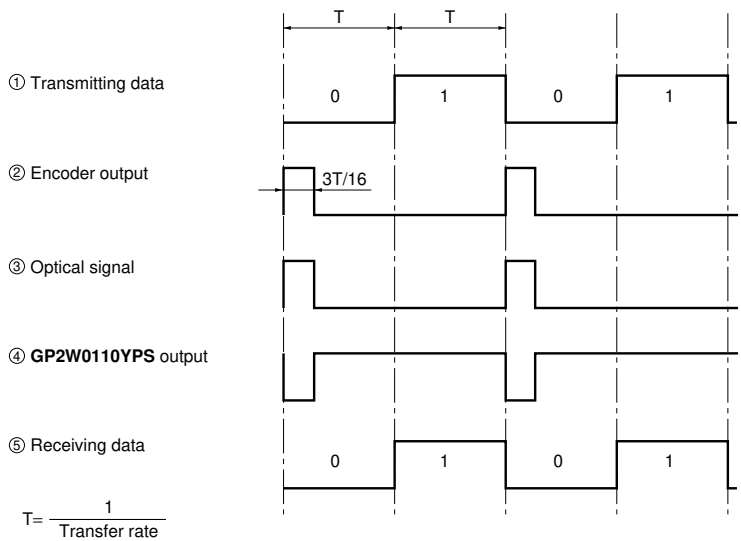


## Fig.2 System Configuration




| SD input | Performance |
|---|---|
| Low | Normal mode |
| High | Shut down mode |

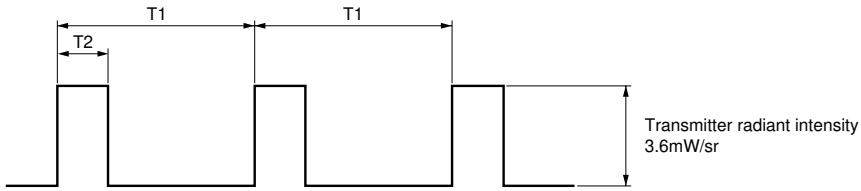
## Fig.3 Example of Signal Waveform




$$T = \frac{1}{\text{Transfer rate}}$$

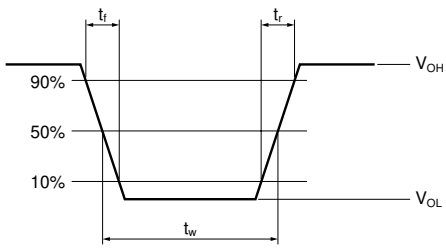
Transfer rate ; 2.4kb/s,9.6kb/s,19.2kb/s,38.4kb/s,57.6kb/s,115.2kb/s

## Fig.4 Input Signal Waveforrm (Receiver side)

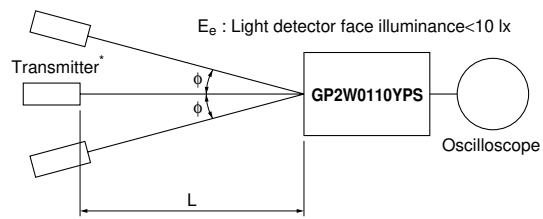



At BR=115.2kb/s:T1=8.68µs, T2=1.63µs

## Fig.5 Output Waveform Specification (Receiver side)



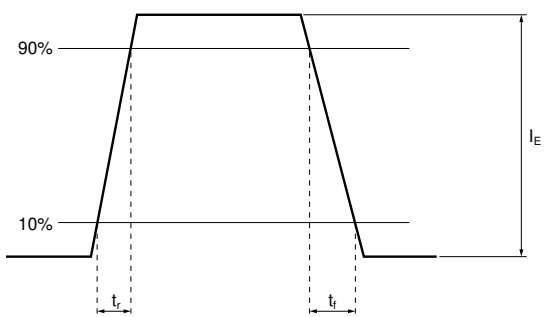

## Fig.6 Standard Optical System (Receiver side)



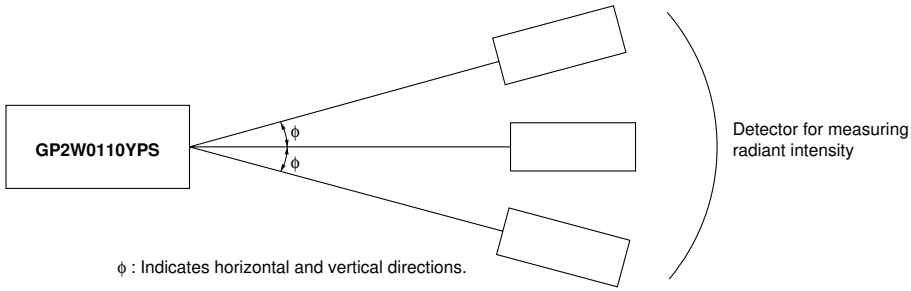

ϕ : Indicates horizontal and vertical directions.

* Transmitter shall use **GP2W0110YPS** (λp=870nm TYP.) which is adjusted the radiation intensity at 40mW/sr

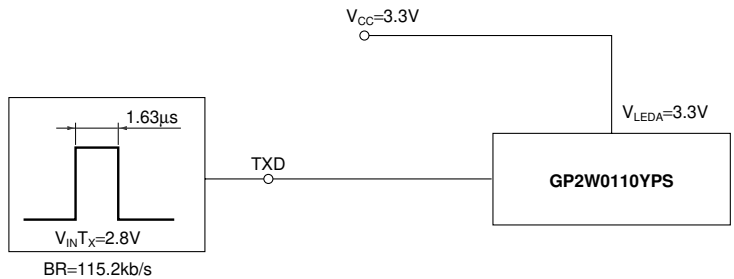
## Fig.7 Output Waveform Specification (Transmitter side)



## Fig.8 Standard Optical System (Transmitter side)

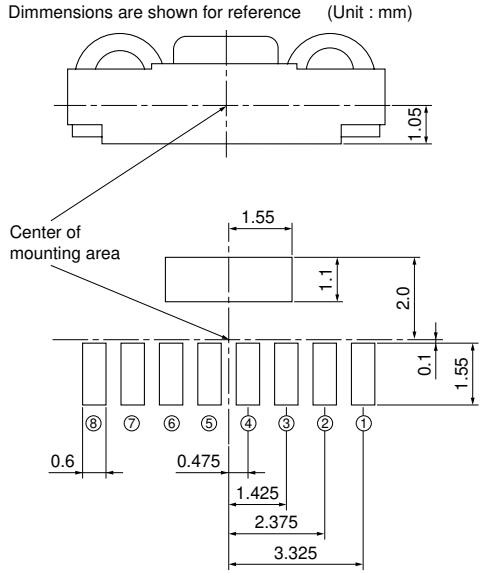



## Fig.9 Recommended Circuit of Transmitter side



## Fig.10 Recommended PCB Foot Pattern

Dimensions are shown for reference

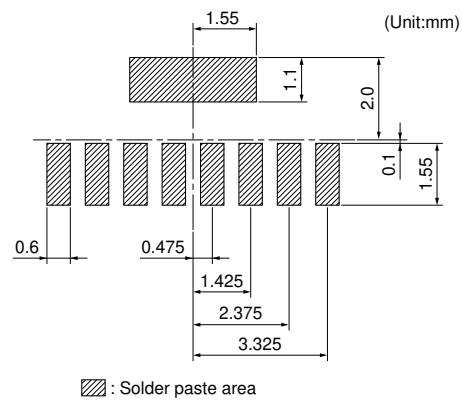



| | Terminal | Symbol |
|---|---|---|
| ① | NC | NC |
| ② | NC | NC |
| ③ | $V_{CC}$ | $V_{CC}$ |
| ④ | Ground | GND |
| ⑤ | Shutdown | SD |
| ⑥ | Receiver data output | RXD |
| ⑦ | Transmitter data input | TXD |
| ⑧ | LED anode | LEDA |

※ connect foot pattern of shield case to GND pattern

## Fig.11 Recommended Size of Solder Creamed Paste (Reference)

Please open the solder mask as below so that the size of solder creamed paste for this device before reflow soldering must be as large as one of the foot pattern land indicated Fig.10



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