

GP2W0116YPS

IrDA Transceiver Module Compliant with IrDA1.2 Low Power

■ Features

1. Compliant with IrDA1.2 low power
2. Integrated package of transmitter/receiver.
(7.2×2.75×height 1.85mm)
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}	260	°C

*1 Pulse width 78.1μs, Duty ratio:3/16

*2 For MAX. 10s

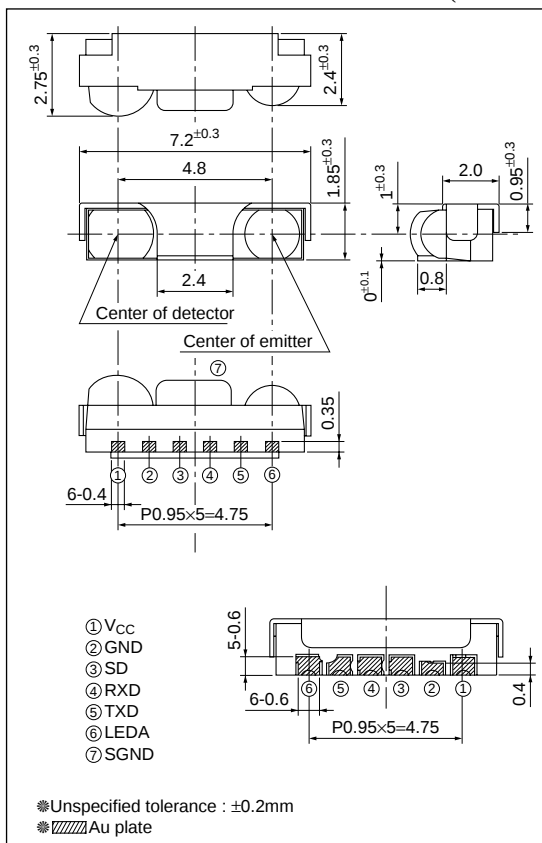
■ Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	2.0 to 3.6	V
LED Supply voltage	V _{LEDA}	2.0 to 6.0	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

*3 Refer to Fig.9

■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

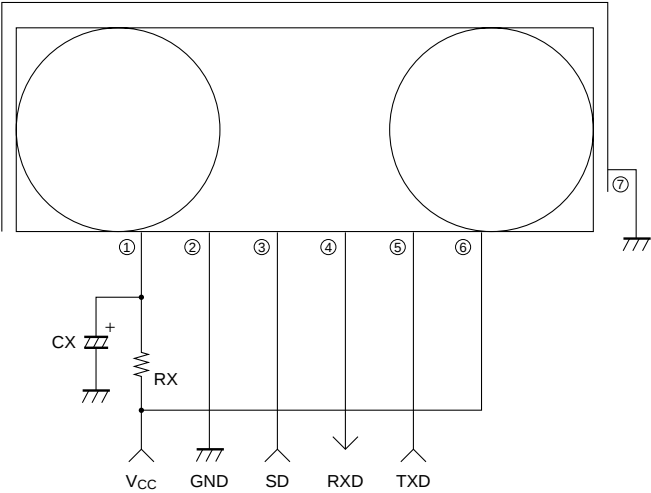
(T_a=25°C, V_{CC}=3.3V)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Receiver side	Dissipation current at no input signal	I _{CC}	No input light, output terminal open, V _{IHSD} =0V	—	90	120	μA
	S/D dissipation current	I _{CC-S}	No input light, output terminal open, V _{IHSD} =V _{CC}	—	0.001	0.1	μA
	High level output voltage	V _{OH}	I _{OH} =-200μA, V _{CC} =2.0 to 3.6V *4	V _{CC} -0.4	—	—	V
	Low level output voltage	V _{OL}	I _{OL} =200μA, V _{CC} =2.0 to 3.6V *4	—	—	0.45	V
	Low level pules width	t _w	BR=115.2kb/s, ϕ≤15°, C _L =10pF *4	1.28	—	6.0	μs
	Rise time	t _r	BR=115.2kb/s, ϕ≤15°, C _L =10pF *4	—	—	0.06	μs
	Fall time	t _f	BR=115.2kb/s, ϕ≤15°, C _L =10pF *4	—	—	0.06	μs
	Maximum communication distance	L	BR=115.2kb/s, ϕ≤15° *4	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	λ _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 VCC
- ② GND
- ③ SD
- ④ RXD
- ⑤ TXD
- ⑥ LEDA
- ⑦ SGND

Components	Recommended values
CX	1μF/6.3V
RX	1 to 15Ω

(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

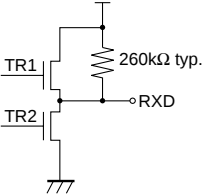
product that there are no problem at all communication area and data rate.

If there are any problem, please check by inserting RX (1 to 15Ω) in the circuit drawing.

*I/O Logic table

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

*RXD Equipment circuit



The diagram illustrates a hardware circuit for interfacing a UART module with an LED. The UART module is connected to an 'Encoder circuit' and a 'Decoder circuit'. The 'Encoder circuit' has two inputs: one from the UART (labeled ①) and another from the 'Decoder circuit' (labeled ⑤). Its output (labeled ②) is connected to the TXD pin of the GP2W0116YPS module. The 'Decoder circuit' has two inputs: one from the TXD pin (labeled ④) and another from the GP2W0116YPS module (labeled ③). Its output (labeled ⑤) is connected back to the UART module. The GP2W0116YPS module is a 16-pin module with pins labeled LEDA, VCC, GND, RXD, and SD. The LEDA pin is connected to an LED (labeled CX) which is also connected to VCC. The VCC pin is connected to a 5V supply. The GND pin is connected to ground. The RXD pin is connected to the TXD pin of the GP2W0116YPS module. The SD pin is connected to the RXD pin of the GP2W0116YPS module. The TXD and RXD pins are also connected to the TXD and RXD pins of the GP2W0116YPS module, respectively. The TXD and RXD pins are also connected to the TXD and RXD pins of the GP2W0116YPS module, respectively. The TXD and RXD pins are also connected to the TXD and RXD pins of the GP2W0116YPS module, respectively.

SD input	Performance
Low	Normal mode
High	Shut down mode

The diagram shows the timing relationship between five signals over four data periods, each of duration T .

- ① Transmitting data:** A digital signal with values 0, 1, 0, 1 across the four periods.
- ② Encoder output:** A signal that transitions from low to high at the start of each period and returns to low at the end. The pulse width is labeled $3T/16$.
- ③ Optical signal:** A signal that transitions from low to high at the start of each period and returns to low at the end, matching the encoder output.
- ④ GP2W0116YPS output:** A signal that transitions from low to high at the start of each period and returns to low at the end, matching the optical signal.
- ⑤ Receiving data:** A digital signal with values 0, 1, 0, 1 across the four periods, matching the transmitting data.

At the bottom left, the period T is defined as:

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

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

Fig.4 Input Signal Waveform (Receiver side)

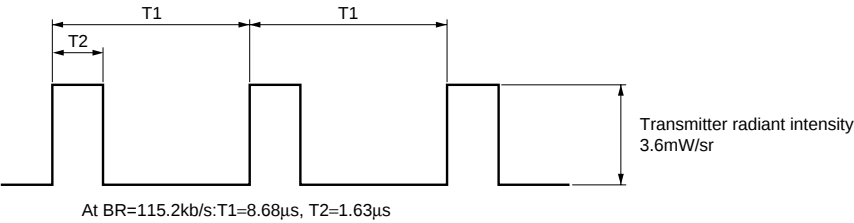


Fig.5 Output Waveform Specification (Receiver side)

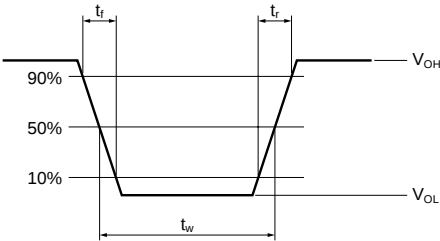
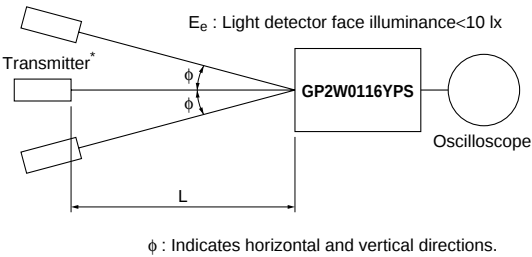


Fig.6 Standard Optical System (Receiver side)



* Transmitter shall use **GP2W0116YPS** ($\lambda_p=870\text{nm}$ TYP.) which is adjusted the radiation intensity at 3.6mW/sr

Fig.7 Output Waveform Specification (Transmitter side)

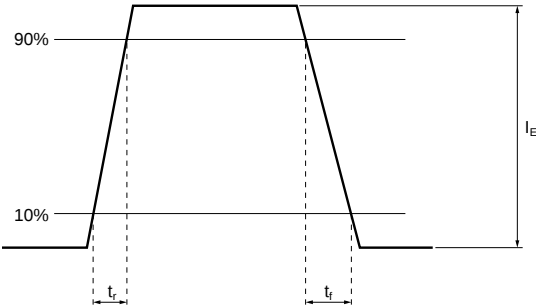


Fig.8 Standard Optical System (Transmitter side)

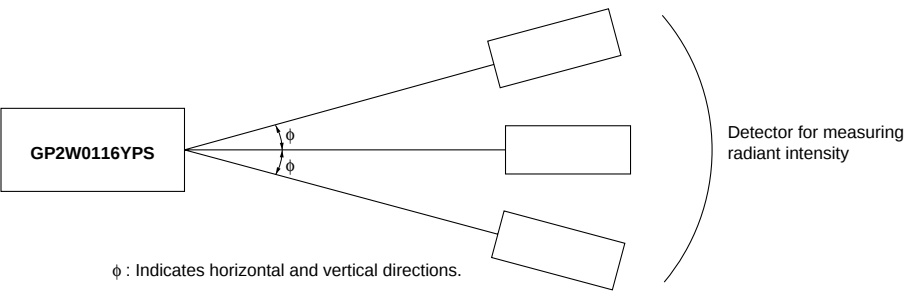


Fig.9 Recommended Circuit of Transmitter side

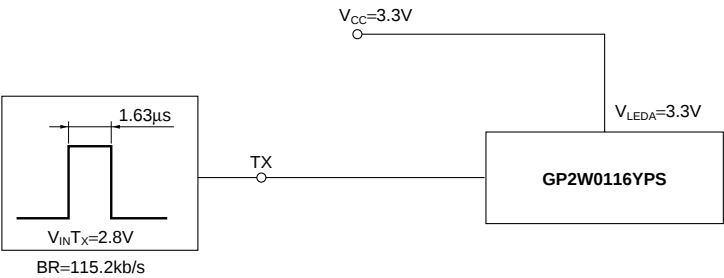
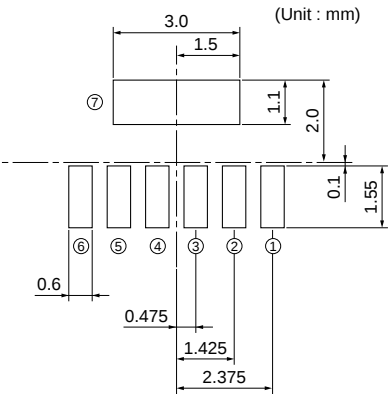


Fig.10 Recommended PCB Foot Pattern

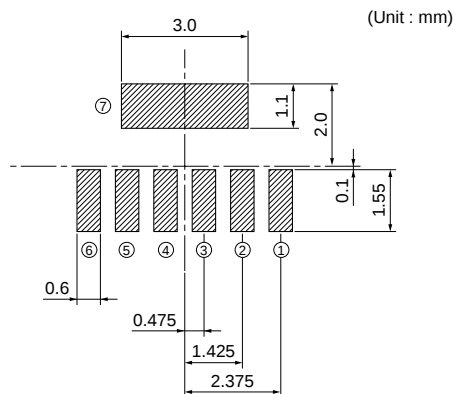
Dimensions are shown for reference



	Terminal	Symbol
①	Supply voltage	V _{CC}
②	Ground	GND
③	Shutdown	SD
④	Receiver data output	RXD
⑤	Transmitter data input	TXD
⑥	LED anode	LEDA
⑦	Shield ground	SGND

Fig.11 Recommended Size of Solder Paste (Reference)

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



▨ : Solder paste area

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