

SHARP

GP2W0116YPS

# 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<sub>a</sub>=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V <sub>CC</sub>	0 to 6.0	V
LED Supply voltage	V <sub>LEDA</sub>	0 to 7.0	V
*1 Peak forward current	I <sub>FM</sub>	60	mA
Operating temperature	T <sub>opr</sub>	-40 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +85	°C
*2 Soldering temperature	T <sub>sol</sub>	260	°C

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

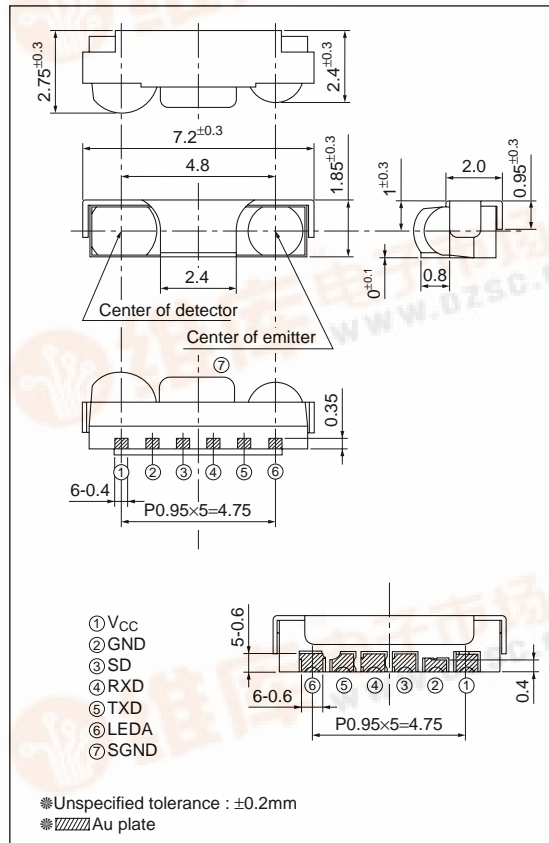
\*2 For MAX. 10s

## ■ Recommended Operating Conditions

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

\*3 Refer to Fig.9

## ■ Outline Dimensions (Unit : mm)



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■ Electro-optical Characteristics

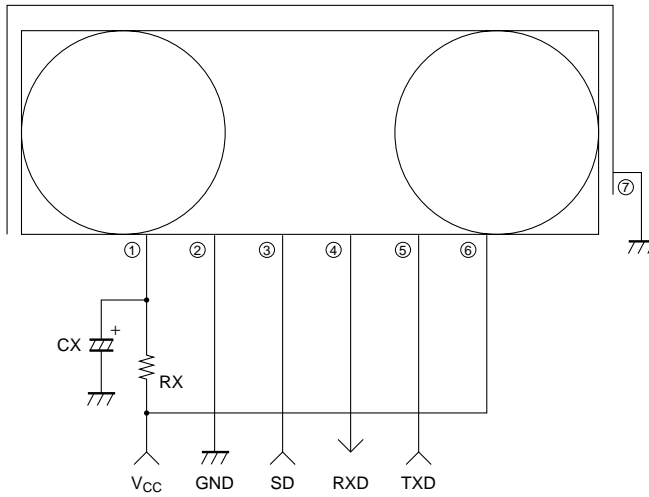
(T<sub>a</sub>=25°C, V<sub>CC</sub>=3.3V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Receiver side	Dissipation current at no input signal	I <sub>CC</sub>	No input light, output terminal open, V <sub>IHSD</sub> =0V	–	90	120	μA
	S/D dissipation current	I <sub>CC-S</sub>	No input light, output terminal open, V <sub>IHSD</sub> =V <sub>CC</sub>	–	0.001	0.1	μA
	High level output voltage	V <sub>OH</sub>	I <sub>OH</sub> =–200μA, V <sub>CC</sub> =2.0 to 3.6V *4	V <sub>CC</sub> –0.4	–	–	V
	Low level output voltage	V <sub>OL</sub>	I <sub>OL</sub> =200μA, V <sub>CC</sub> =2.0 to 3.6V *4	–	–	0.45	V
	Low level pulses width	t <sub>w</sub>	BR=115.2kb/s, φ≤15°, C <sub>L</sub> =10pF *4	1.28	–	6.0	μs
	Rise time	t <sub>r</sub>	BR=115.2kb/s, φ≤15°, C <sub>L</sub> =10pF *4	–	–	0.06	μs
	Fall time	t <sub>f</sub>	BR=115.2kb/s, φ≤15°, C <sub>L</sub> =10pF *4	–	–	0.06	μs
Maximum communication distance	L	BR=115.2kb/s, φ≤15° *4	21	–	–	cm	
Transmitter side	Radiant intensity	I <sub>E</sub>	BR=115.2kb/s, φ≤15°, V <sub>IHTXD</sub> =2.8V *5	4.0	–	25	mW/sr
	Peak emission wavelength	λ <sub>p</sub>		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
High	Don't care	OFF	Don't care	OFF	OFF	Pull-up

\*RXD Equipment circuit

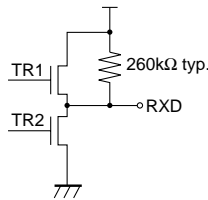
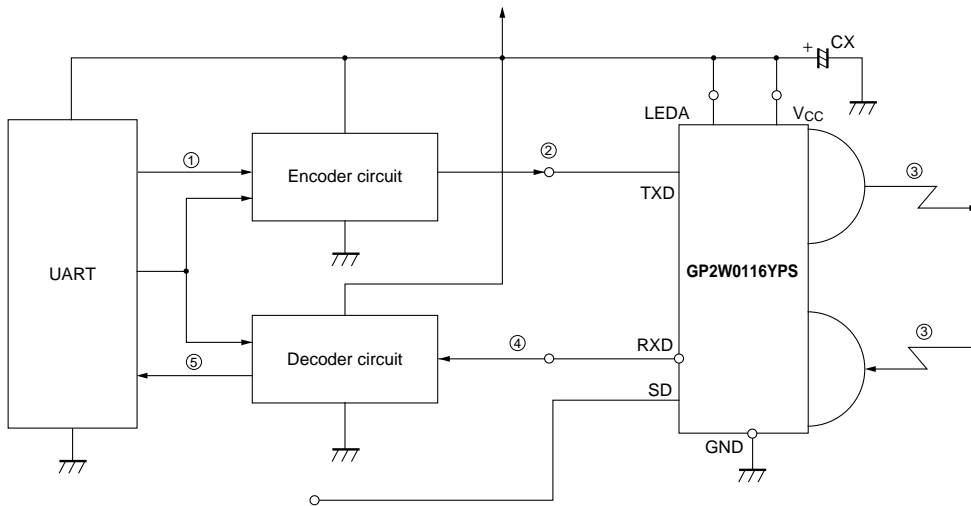
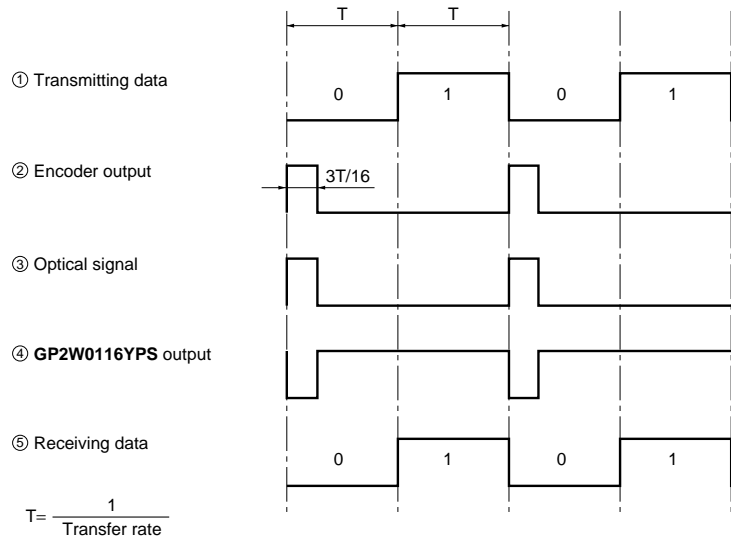


Fig.2 System Configuration



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 Waveform (Receiver side)

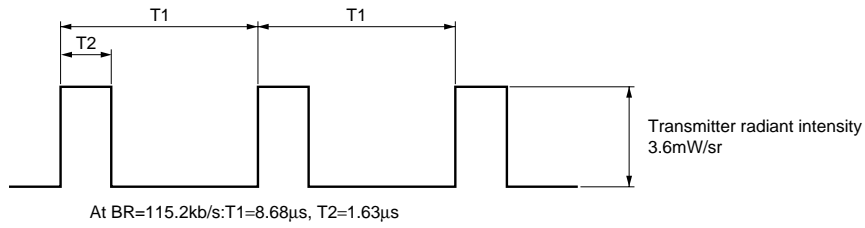


Fig.5 Output Waveform Specification (Receiver side)

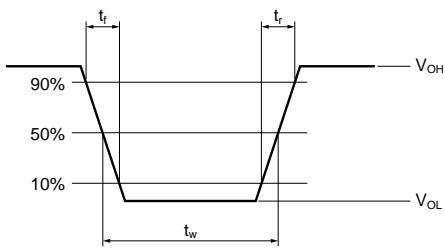
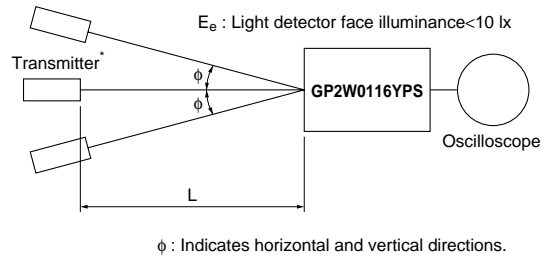


Fig.6 Standard Optical System (Receiver side)



\* 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)

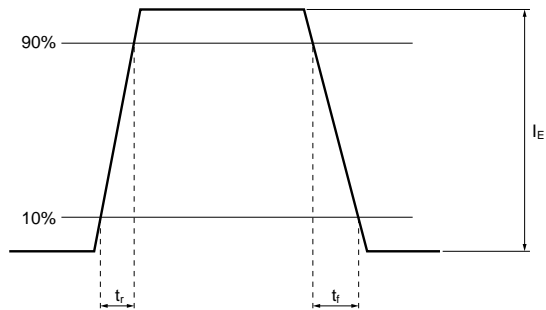


Fig.8 Standard Optical System (Transmitter side)

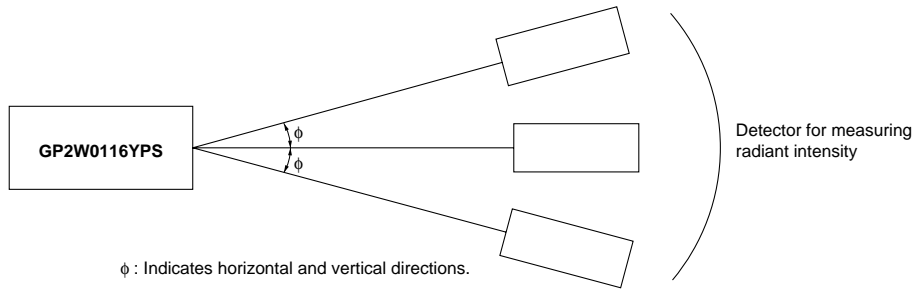


Fig.9 Recommended Circuit of Transmitter side

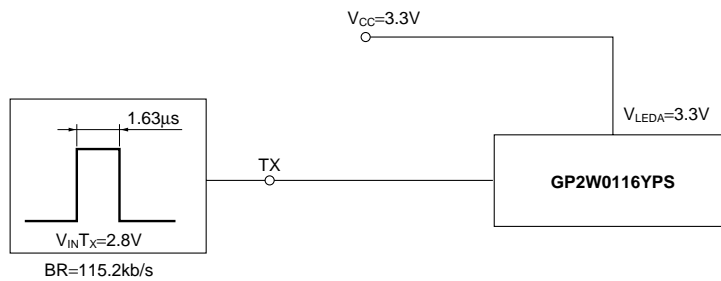
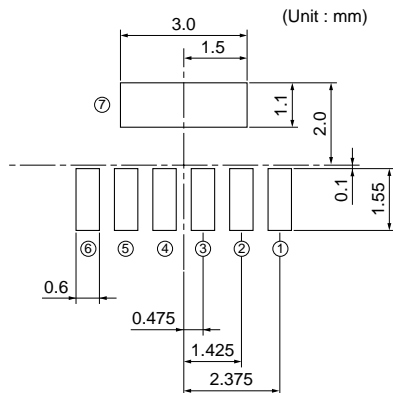


Fig.10 Recommended PCB Foot Pattern

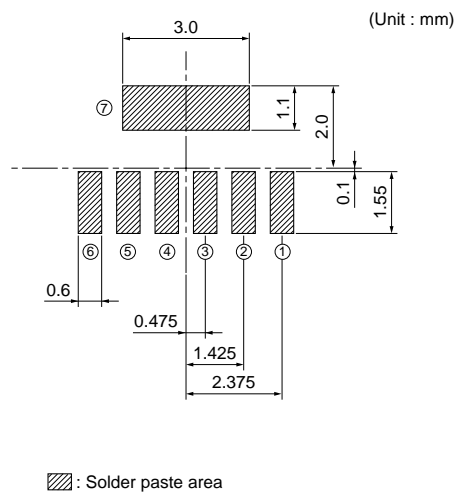
Dimensions are shown for reference



Terminal	Symbol
① Supply voltage	V <sub>CC</sub>
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



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