

■ Recommended Operating Conditions (Ta=25°C)

Parameter	Symbol	Rating	Unit
Operating Supply voltage	V _{CC}	2.7 to 5.5	V
Operating temperature	T _{opr}	0 to +70	°C
SIR bit rate	–	9.6 to 115.2	kbps
FIR bit rate	–	1.152/4	Mbps

■ Electro-optical Characteristics (Ta=25±3°C, V_{CC}=3.3±0.1V, 5±0.1V, Ambient illuminance of detecting face: 100lx or less)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Receiver side	Dissipation current at no input signal	I _{CC}	RXOUT:H, TXIN:L, V _{CC} =3.3V	–	–	1.2	mA
			RXOUT:H, TXIN:L, V _{CC} =5.0V	–	–	1.5	mA
	S/D dissipation current	I _{CCS}	RXOUT:H, TXIN:L, V _{CC} =3.3V	–	0.1	1	μA
			RXOUT:H, TXIN:L, V _{CC} =5.0V	–	0.2	2	μA
	Dissipation current	I _{CCP}	Peak Value, V _{CC} =3.3V (2.4Ω), 5.0V (6.8Ω)	–	400	600	mA
	Switching time (Shut down to stand by)	trSD		–	–	1.5	ms
	Receiver sensitivity (–15°≤θ≤+15°)	S _{Rxθ}	SIR:9.6k to 115.2kbps	0.04	–	5 000	W/m ²
			FIR:1.152M/4Mbps	0.01	–	5 000	W/m ²
	Low level output voltage	V _{OL}	V _{CC} =3.3, 5.0V	–	–	0.4	V
	High level output voltage	V _{OH}	V _{CC} =3.3, 5.0V	V _{CC} -0.4	–	–	V
	Rise time	t _{rrA}	SIR:9.6k to 115.2kbps	–	–	200	ns
		t _{rrB}	FIR:1.152M/4Mbps	–	–	40	ns
	Fall time	t _{frA}	SIR:9.6k to 115.2kbps	–	–	200	ns
		t _{frB}	FIR:1.152M/4Mbps	–	–	40	ns
	Peak sensitivity wavelength	λ _{cx}		–	940	–	nm
	Low level pules width	t _{w1}	SIR:Pulse width 19.53μs(9.6kbps), Duty 3/16	1	–	22	μs
t _{w2}		SIR:Pulse width 1.63μs(115.2kHz), Duty 3/16	1	–	3	μs	
t _{w3}		FIR:Pulse width 217ns(1.152Mbps), Duty 1/4	110	–	500	ns	
t _{w4}		FIR:Pules width Single 125ns(4Mbps), Duty 1/4	85	–	165	ns	
t _{w5}		FIR:Pules width Double 250ns(4Mbps), Duty 1/4	210	–	290	ns	
Peak emission wavelength	λ _{tx}		850	880	900	nm	
Radiant intensity	φ=0°	I _{ELO}	Low Power	–	15	–	mW/sr
		I _{EMO}	Middle Power	–	60	–	mW/sr
	–15°≤φ≤+15°	I _{EFθ}	Full Power	100	–	500	mW/sr
Low level input voltage	V _{IL}	V _{CC} =3.3, 5.0V	–	–	V _{CC} ×0.2	V	
High level input voltage	V _{IH}	V _{CC} =3.3, 5.0V	V _{CC} ×0.2	–	–	V	
TXin terminal input current	I _{IH}	TXIN=V _{CC} =5.0V	–	–	50	μA	
	I _{IL}	TXIN=GND	–0.1	0	0.1	μA	
Transmission signal rise time	t _{rx}		–	–	40	ns	
Transmission signal fall time	t _{fx}		–	–	40	ns	

■ Truth Table

Input		Output	
TXD (Transmitter)	*1 Receiver	State of LED (Transmitter)	RXD terminal
High	–	ON	X
Low	ON	OFF	Low
Low	OFF	OFF	High

X:Do not care

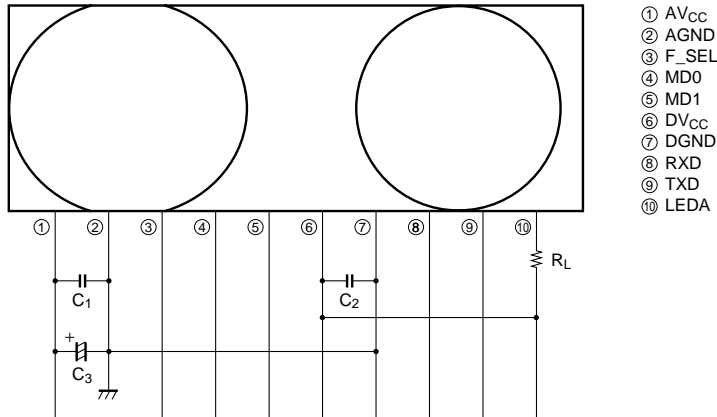
*1 External optical signal receiving state of photodiode

■ Input Output Logic Table

MD0	MD1	F_SEL	TXD	RXD terminal mode	TXO *2	Remarks
1	0	X	0	Shut down	Shut down	—
	0	1	0	RXA	X	Latch TXD *1
	0	1	1	RXB	X	Latch TXD *1
0	0	0	X	RXA	HPW	TXO Output High Power mode
0	1	0	X	↓	MPW	TXO Output Middle Power mode
1	1	0	X	↓	LPW	TXO Output Low Power mode
0	0	1	X	RXB	HPW	TXO Output High Power mode
0	1	1	X	↓	MPW	TXO Output Middle Power mode
1	1	1	X	↓	LPW	TXO Output Low Power mode

*1 F_SFL → 0:reset latching state of TXD, and turn to RXA channel.
 RXA:RXA channel mode:115kbps or less (SIR 115.2kbps, 9 600bps)
 RXB:RXB channel mode:115kbps or more (FIR 1.152Mbps, 4Mbps)
 *2 LED operating mode

Fig.1 Recommended External Circuit



Components	Recommended values
$C_1 \cdot C_2$	$1\mu F \pm 10\%$ (Note 1)
C_3	$4.7\mu F \pm 10\%$ (Note 2)
R_L	$2.4\Omega \pm 5\%$ 1/2W ($V_{CC}=3.3V$)
	$6.8\Omega \pm 5\%$ 1/2W ($V_{CC}=5V$)

(Note 1) Please locate nearby this transceiver choosing the ceramic capacitor with higher frequency feature

(Note 2) Please choose the most suitable C_X according to the noise level and noise frequency of power supply

Fig.2 Output Waveform Specification(Receiver side)($C_L \leq 10pF$)

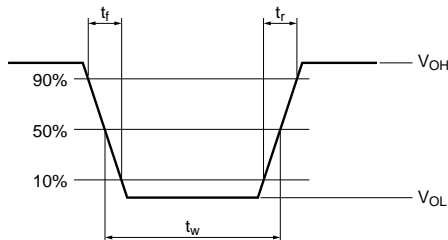
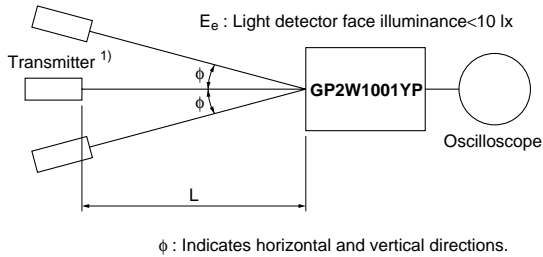


Fig.3 Standard Optical System(Receiver side)



Transfer rate	T ₁	T ₂	T ₂ /T ₁	Radiant intensity
9.6kbps	104μs	19.53μs	3/16	40mW/sr
115.2kbps	8.68μs	1.63μs	3/16	40mW/sr
1.152Mbps	868ns	217ns	1/4	100mW/sr
4Mbps (S)	500ns	125ns	1/4	100mW/sr
4Mbps (W)	1 000ns	250ns	1/4	100mW/sr

The light emitting diode (SHARP GL710, λ_p=850 to 900nm) is used as the transmitter, where the following continuous signals are transmitted.
 In Fig.3, output signal shall be complete receiver side electro-optical characteristics.

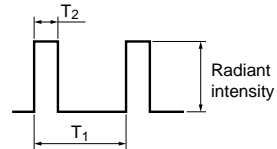


Fig.4 Output Waveform Specification(Transmitter side)

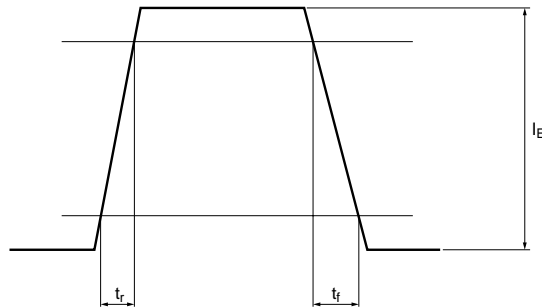


Fig.5 Standard Optical System(Transmitter side)

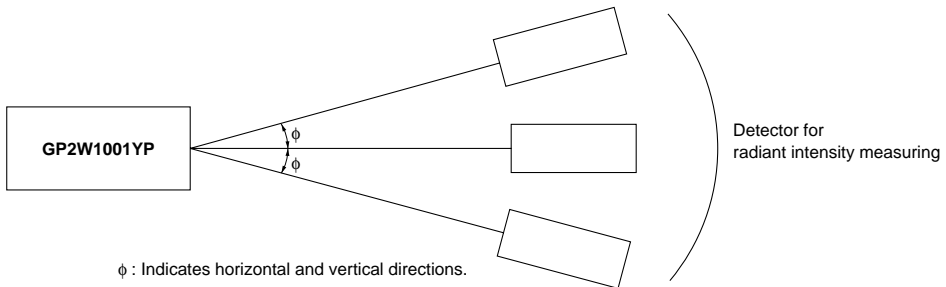


Fig.6 Recommended Circuit of Transmitter side

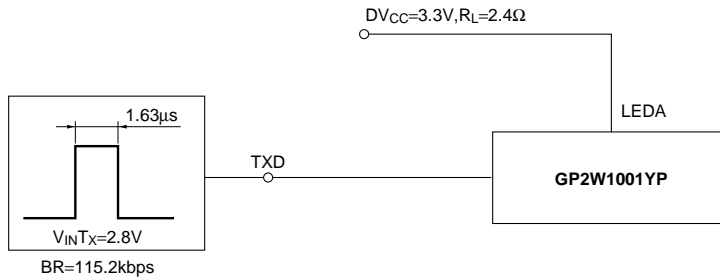


Fig.7 Peak Forward Current vs. Ambient Temperature

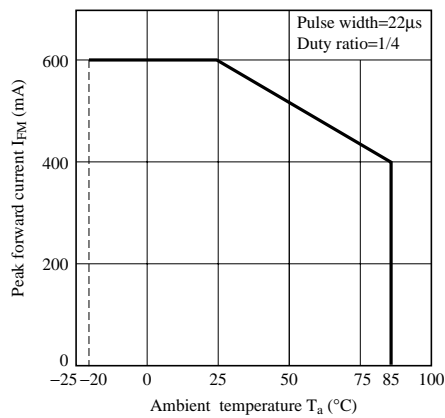


Fig.8 Recommended PCB Foot Pattern

Dimensions are shown for reference

(unit : mm)

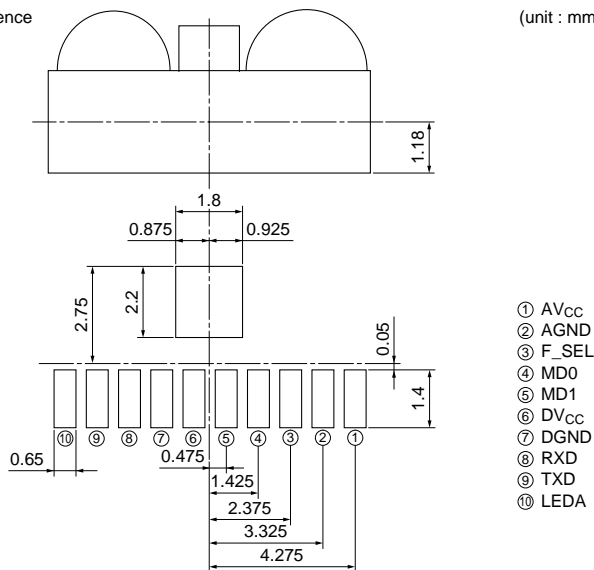
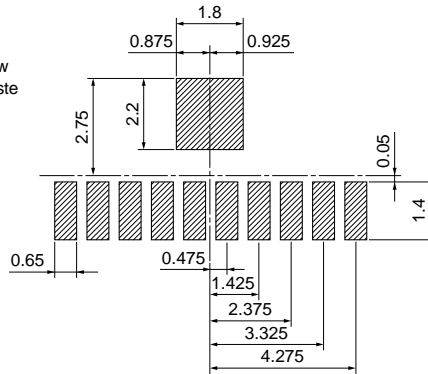


Fig.9 Recommended Size of Solder Creamed Paste (Reference)

Dimensions are shown for 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 at Fig.8

(unit : mm)



▨ : Solder paste area

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