GP1FJ100RP

Thin Low Voltage Operation Type Optical Mini-jack for Digital Audio Equipment

■ Features

1. Thin type fiber optic receiver (ϕ2.5mm)
2. Both optical and electrical signal can be received
3. Built-in shutdown function
   (Comsumption current at shutdown mode:MAX. 1μA)
4. Low voltage operation (V_{CC} 1.5 to 3.6V)
5. High speed data transmission
   (Signal transmission speed : MAX, 8Mb/s (NRZ signal))

■ Applications

1. MD players
2. Portable CD players (Optic receiver part)

■ Absolute Maximum Ratings (Photoelectric conversion element) (T_a=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	−0.5 to +5.5	V
Operating temperature	T_{opr}	−20 to +70	°C
Storage temperature	T_{stg}	−30 to +80	°C
*1 Soldering temperature (Reflow)	T_{sol}	240	°C
*2 Hand soldering temperature	T_{osl}	355	°C
Output current	I_{OH}	1 (source current)	mA
	I_{OL}	1 (sink current)	mA

*1 For 10s
*2 For 3.5s (2 times or less)

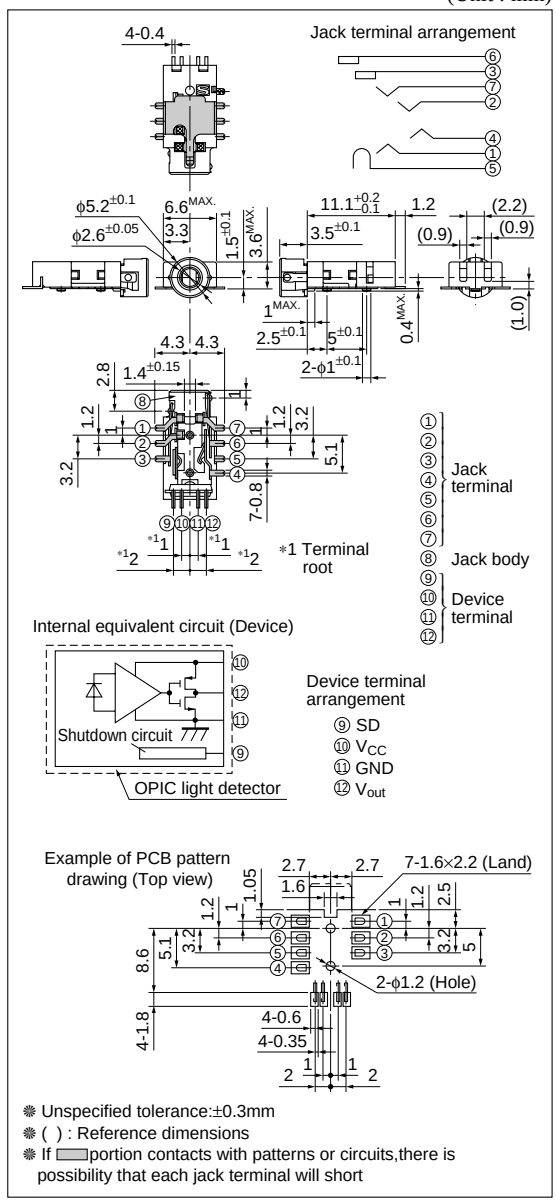
■ Absolute Maximum Ratings(Jack)

Parameter	Symbol	Rating	Unit
Total power dissipation	P_{tot}	D.C. 12V, 1A	−
Operating temperature	T_{opr}	−20 to +70	°C
Storage temperature	T_{stg}	−30 to +80	°C
*1 Soldering temperature (Reflow)	T_{sol}	240	°C
*2 Hand soldering temperature	T_{osl}	355	°C
*3 Isolation voltage	V_{iso}	A.C. 500V_{rms}	−

*3 For 1minute

■ Outline Dimensions

(Unit : mm)



∗ "OPIC"(Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a signal chip.

■ Recommended Operating Conditions

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating supply voltage	V_{CC}	1.5	2.4	3.6	V
Operating transfer rate	T	0.1	–	8	Mb/s
Receiver input optical power level	P_C	–27.0	–	–14.5	dBm

■ Electro-optical Characteristics

(T_a=25°C, V_{CC}=2.4V)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Peak sensitivity wavelength	λp	———————	–	660	–	nm
Dissipation current	I_{CC}	Refer to Fig.1	–	2	3	mA
Consumption current at shutdown mode	$I_{SC\ (SD)}$	Refer to Fig.2	–	–	1	μA
High level output voltage	V_{OH}	Refer to Fig.3	V_{CC}×0.8	–	–	V
Low level output voltage	V_{OL}	Refer to Fig.3	–	–	V_{CC}×0.2	V
Rise time	t_r	Refer to Fig.3	–	7	30	ns
Fall time	t_f	Refer to Fig.3	–	7	30	ns
Low → High delay time	t_{pLH}	Refer to Fig.3	–	–	130	ns
High → Low delay time	t_{pHL}	Refer to Fig.3	–	–	130	ns
Pulse width distortion	Δt_W	Refer to Fig.3	–20	–	+20	ns
Jitter	Δt_j	Refer to Fig.4, P_C=–14.5dBm	–	–	30	ns
		Refer to Fig.4, P_C =–27dBm	–	–	30	ns

■ Mechanical and Electrical Characteristics(Jack)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Insertion force, with drawal force	F_p	*4	3	–	35	N
Contact resistance	R_{con}	*5	–	–	30	mΩ
Isolation resistance	R_{iso}	D.C. 500V, 1minute	100	–	–	MΩ

Note) This jack is designed for applicable to ϕ2.5 compact single head plug (JIS C6560)

*4 Measuring method of insertion force and withdrawal force
Insertion and withdrawal force shall be measured after inserting and withdrawing 3 times by using JIS C6560 standard plug for test

*5 Measuring method of contact resistance
It measures at 100mA or less and 1 000Hz at the condition of inserting JIS C6560 standard plug for test in which movable contact terminal and make contacts are described

Fig.1 Dissipation Current

Input conditions		Measuring method
Supply voltage	V_{CC}=2.4V	Measured on an ammeter (DC average amperage)
Optical output coupling with fiber	P_C=–14.5dBm	
Standard transmitter input signal	6Mb/s NRZ, Duty 50% or 3Mb/s biphase mark PRBS signal	

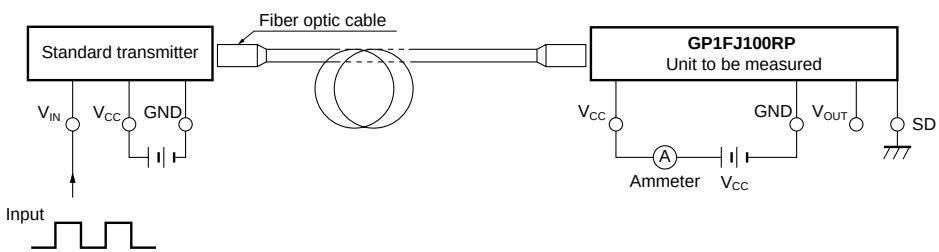
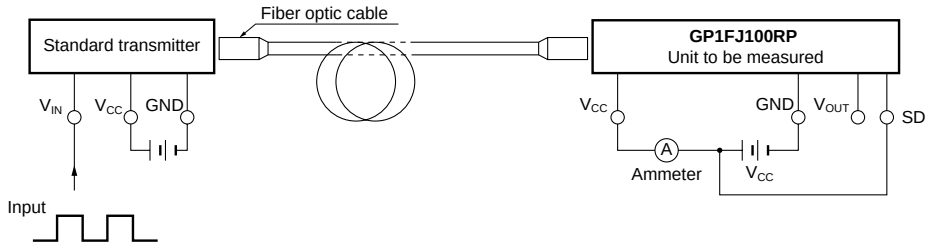
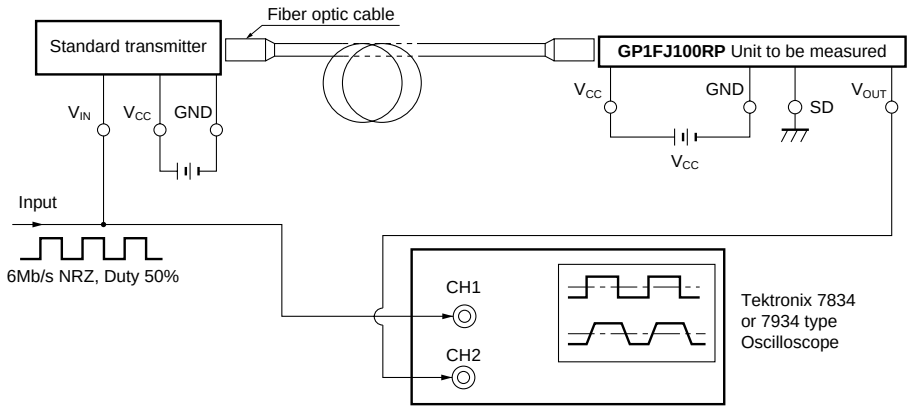


Fig.2 Measuring Method of Consumption Current at Shutdown Mode



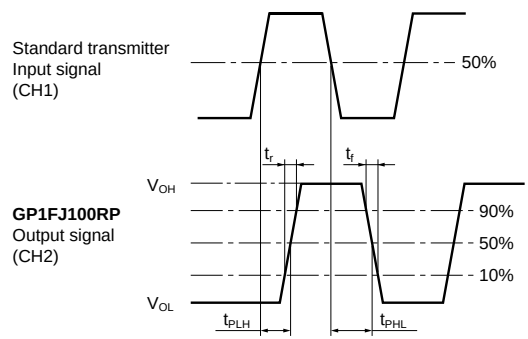
When shutdown terminal (SD terminal) receives an high level signal, it becomes to shutdown mode
V_{OUT} output is low level at shutdown mode

Fig.3 Measuring Method of Output Voltage and Pulse Response



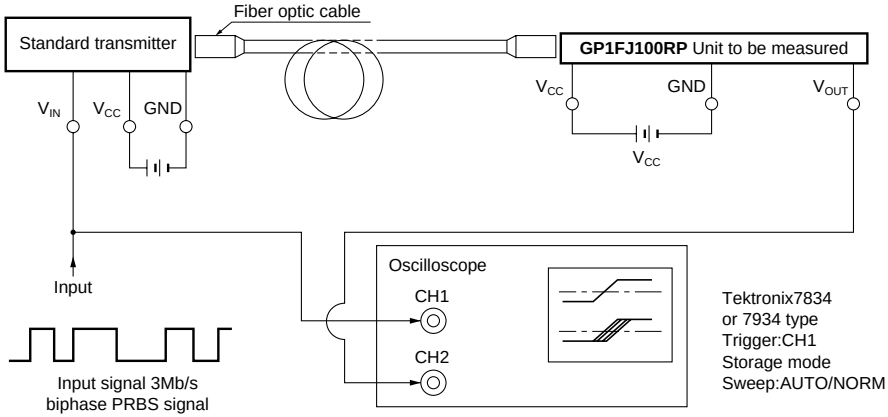
Test item

Test item	Symbol
Low → High pulse delay time	t_{PLH}
High → Low pulse delay time	t_{PHL}
Rise time	t_r
Fall time	t_f
Pulse width distortion $\Delta t_w = t_{PHL} - t_{PLH}$	Δt_w



Notes (1) V_{CC}=2.4V (State of operating)
(2) The fiber coupling light output set at −14.5dBm/−27dBm
(3) The probe for the oscilloscope must be more than 1M Ω and less than 10pF
(4) The output (H/L level) of **GP1FJ100RP** are not fixed constantly when it receives the modulating light (including DC light, no input light) less than 0.1Mb/s

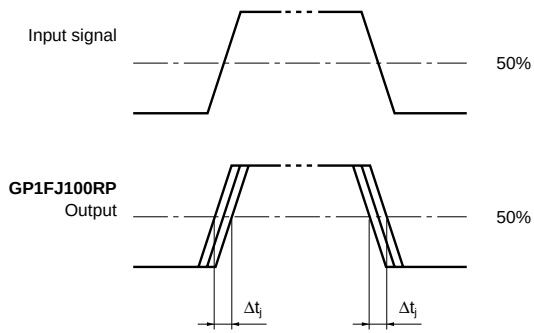
Fig.4 Measuring Method of Jitter



Test item

Test item	Symbol	Test condition
Jitter	Δt_j	Set the trigger on the rise of input signal to measure the jitter of the rise of output
Jitter	Δt_j	Set the trigger on the fall of input signal to measure the jitter of the fall of output

Notes (1) The fiber coupling light output set at −14.5dBm/−27dBm
(2) The waveform write time shall be 3 seconds. But do not allow the waveform to be distorted by increasing the brightness too much
(3) V_{CC}=2.4V (State of operating)
(4) The probe for the oscilloscope must be more than 1M Ω and less than 10pF



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