Series 3978 Optical Jack Toslink Receiver with RCA

Material

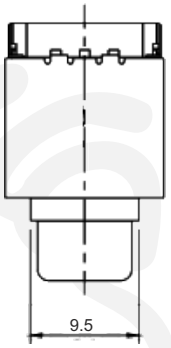
Housing:	PBT, black
Spring:	SUS
Dust cap:	PBT, grey
Holder:	PBT, black
Optic component:	Phosphor bronze, tin plating
LED cover:	PBT, black

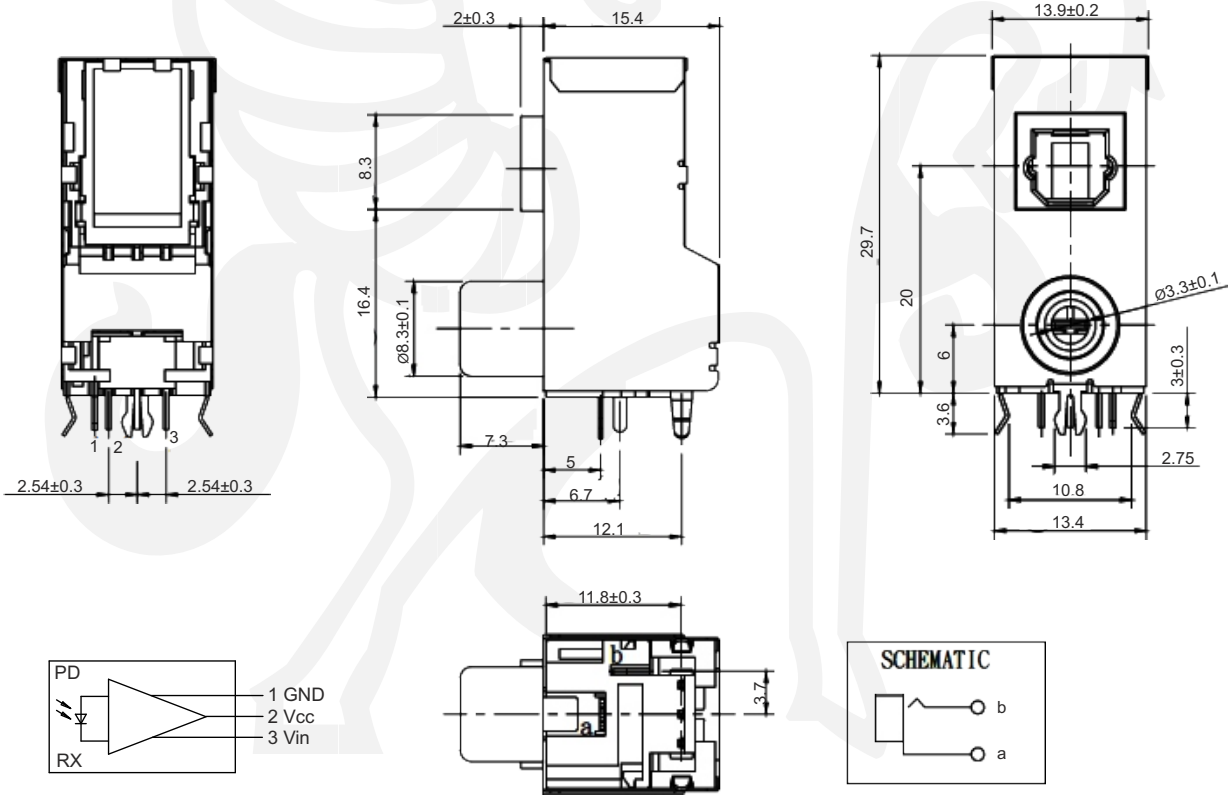
Device selection

IC material:	Si
LED peak:	700 λp(nm)
Operating voltage:	2.7 - 5.25 (Vcc)
Dissipation current:	Vcc=3V: 3.5 (mA)
	Vcc=5V: 5 (mA)
Fiber coupling light input:	min. -27 (dBm), max. -14.5(dBm)

Features

High PD sensitivity for red light
Receiver sensitivity: up to -27 dBm (min. for 16 Mbps)
up to -21 dBm (min. for 25 Mbps)





Tolerances	
Linear	0.1~2.0 ± 0.10
	>2.0 ± 0.20

RoHS compliant

All dim. in mm

3978 R	0	Y
Series R = Receiver	Option	Packing Y = Tray

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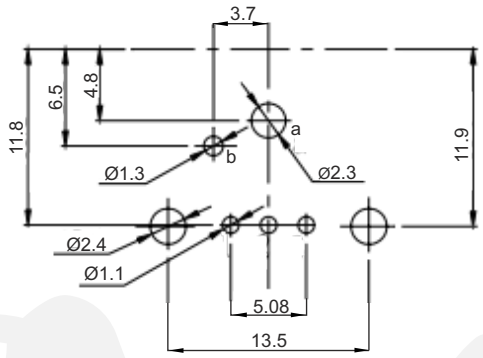

Recommended P.C.B. Layout

Absolute Maximum Rating (Ta = 25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	-0.5 to 5.5	V
Storage Temperature	Tstg	-30 to 80	°C
Operating Temperature	Topr	-20 to 70	°C
Soldering Temperature	Tsol	260*	°C

* Soldering time ≤ 5s / 2 times.

Electro-Optical Characteristics

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Operating voltage for optic unit	Vcc	-	2.7	-	5.25	V
Peak sensitivity wavelength	λp	-	-	700	-	nm
Transfer speed		NRZ signal (Note 1)	0.1	-	16	Mbps
Transmission distance		Using APF (Note 2)	0.2	-	20	m
Pulse Width Distortion	tw	16 Mbps NRZ Signal	-20	-	20	ns
Receiver input optical power level (Note 3)	Pi	*1	-27	-	-14.5	dBm
Dissipation Current	Icc	*1	-	3.5	15	mA
High Level Output Voltage	V_{OH}		2.4	-	-	V
Low Level Output Voltage	V_{OL}		-	-	0.4	V
Rise Time	t_r	*3	-	-	25	ns
Fall Time	t_f	*3	-	-	25	ns
Low → High propagation delay time	t_{PLH}	*3	-	-	100	ns
High → Low propagation delay time	t_{PHL}	*3	-	-	100	ns
Jitter time	tj	*3	-	1.5	15	ns

Note 1: This operating transfer rate shall be a specification when NRZ, duty 50% of continuous „0101...“ signal is transfered. The output (H/L level) of this component are not fixed constantly when it receivers.
Note 2: All plastic fiber (980/1000µ m)
Note 3: BER ≤ 10^-9, peak value.

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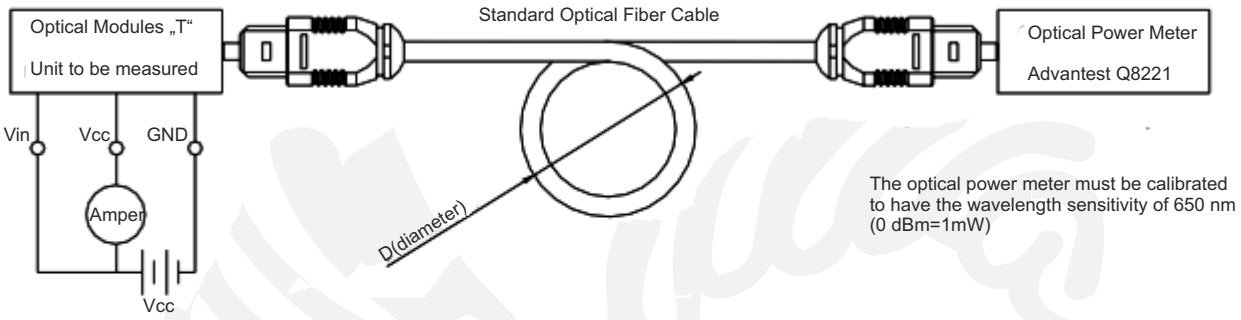
Mechanical characteristics (Ta = 25°C)

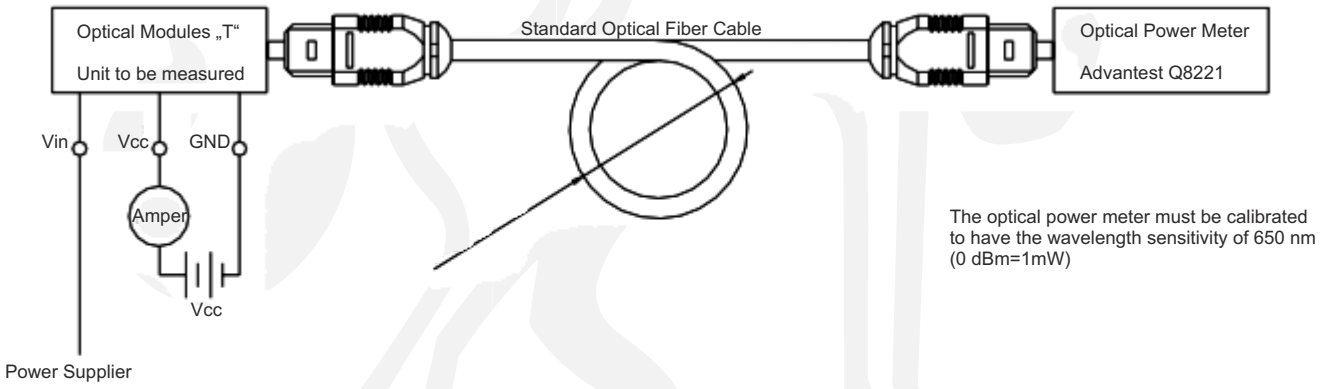
Parameter	Min.	Typ	Max.	Unit
Mating force	-	-	39.2	N
Unmating force	3.9	-	39.2	N

Measuring Method (1)



Conditions:
1. Vcc = 5.0 V ± 0.05 V (DC)
2. If bundle up the fiber optic cable, make it into a loop with the diameter D ≥ 10cm

Measuring Method (2)



Conditions:
1. Vcc = 5.0 V (State of Operating)
2. Amper Current Meter
3. Vin: to Power Supplier (or Signal Generator) (DC:0 - 5 V)

JuInput conditions and the method of judgement:

No.	Input conditions	Judgement
1	$V_{in} \geqq 2.0V$	$-21 \leqq P_f \leqq -15$ dBm, Icc $\leqq$ 10mA
2	$V_{in} \leqq 0.8V$	$P_f \leqq -36$ dBm, Icc $\leqq$ 10mA

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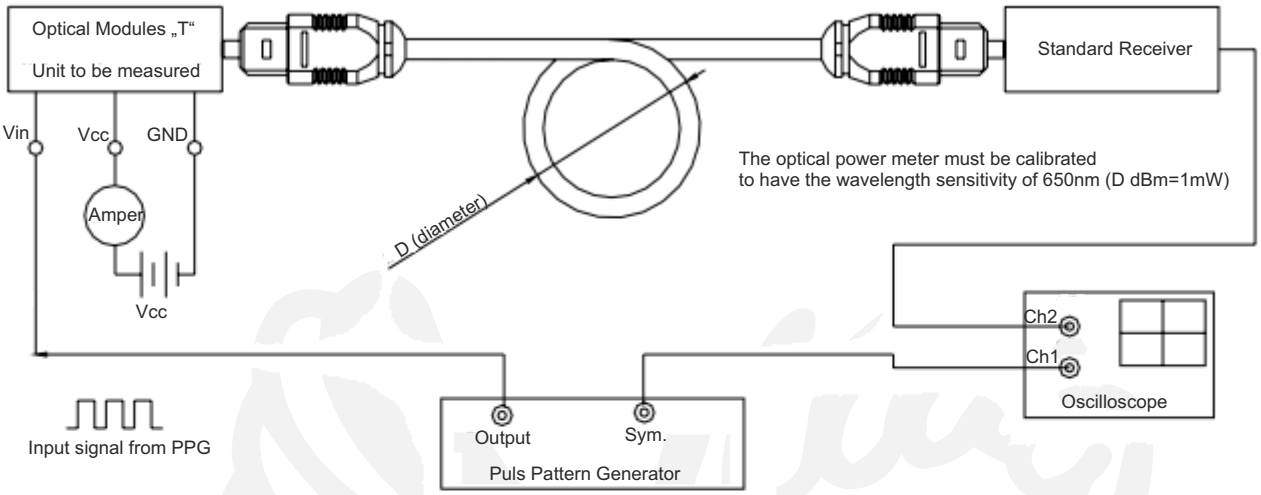
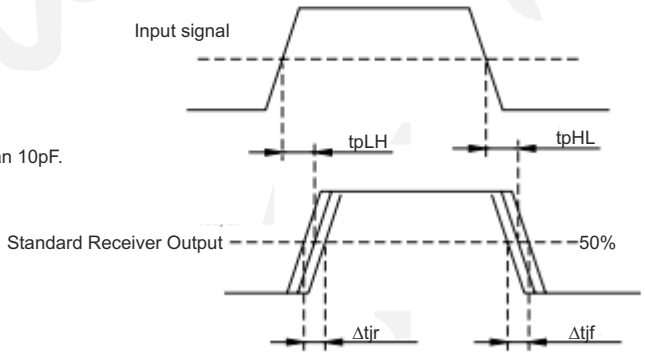
Measuring Method (3)





Note 1: Vcc = 5.0V (State of operating)
Note 2: The fiber coupling light output set at -14.5 dBm or -24dBm
Note 3: The probe for the oscilloscope must be more than 1MΩ and less than 10pF.

No.	Test Item	Symbol	Test Conditions
1	Jittter	Δt_{jr}	Set the trigger on the rise of input signal to measure the jitter of the rise of output.
2	Jitter	Δt_{jf}	Set the trigger on the rise of input signal to measure the jitter of the rise of output.

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Reliability test

No.	Item	Test Condition	Samples (n) Defective (c)
1	High temp. storage	Ta = 80°C, 500h	n=22, c=0
2	Low temp. storage	Ta = -30°C, 500h	n=22, c=0
3	High temp. operation	Ta = 60°, Vcc=5.0V ON, 500h	n=22, c=0
4	High temp. & Humidity storage	Ta = 40°C, 90%RH, 500h	n=22, c=0
5	Temp. Cycling	Ta = -30°C ~ +80°C (30min) (30min) 20 cycles	n=22, c=0
6	Shock	Acceleration 1000m/s², pulse width 6 ms, X,Y,X/ 3 times each direction	n=11, c=0
7	Vibration	10 ~ 55 Hz/sweep 1 min. amplitude: 1.5mm, X,Y,Z/2 hour each.	n=11, c=0
8	Terminal Strength (tension)	Weight: 5N, 30sec./each terminal	n=11 c=0
9	Terminal Strength (bending)	Weight: 2.5N (in the axial direction),0°-90°-0°, 2times/each terminal 2times/each terminal	n=11, c=0
10	Soldering Heat	Ta=260°C±5°C, 5sec., 2 times. Dip the area at adistance of more than 1.6mm from the element base, Ta=350°C±5°C, 3sec, 1 time. Dip the area at a distance of more than 7mm from the lens.	n=11, c=0
11	Solder ability	Ta=245°C±5°C, 5 sec. used a rosin flux.	n=11, c=0
12	Repeated Operation	After 500 cycles of mating and un-mating, the following value shall be satisfied.	n=11, c=0
13	Repeat open/close operation of shutter	After 1000 times the function shall be no trouble. Shutter shall be no damage.	n=11, c=0

If there is any doubt aboutthe results Ambient temperature: 5°C ~ 35°C, relative humidity : 45% ~ 85%.
In the test 1 to 5, 10 above the transmitter shall be subjected to standard atmospheric conditions for 2 hrs.
after which measurement shall be made.

Judgement criteria

In the testing items of 1-7 and 10 electro-optical characteristics shall be satisfied in following:

Upper specification limit x 1.2 or more Lower specification limit x 0.8 or less	Upper specification limit x 1.2 or more Lower specification limit x 1.2 or less
Dissipation current (Icc) High level output voltage (V_{OH}) Low level output voltage(V_{OL}) Rise time(tr) Fall time (tf) Low to high propagation delay time (t_{PLH}) High to low propagtion delay time (t_{PHL}) Jitter time (Δt_j)	Pulse width distortion (Δt_w)

Test No. 8 & 9: Without cracks on the terminal.
Test No. 11 : A new uniform coating of solder shall cover a minimum of 75% of the surface be immersed.
Test No. 12 : Mating force ≤ 39.2N; 5.9N≤ un-mating force ≤ 39.2N.

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