

Photolink- Fiber Optic Receiver PLR253 Series



Features

- High speed signal transmission (25Mbps NRZ Signal)
- High PD sensitivity optimized for red light
- Data : NRZ signal
- Low power consumption for extended battery life
- Built-in threshold control for improved noise Margin
- The product itself will remain within RoHS compliant version.
- Receiver sensitivity: up to -27dBm (Min. for 25Mbps)

Description

The optical receiver is packaged with custom optic data link interface, integrated on a proprietary CMOS PDIC process.

The unit functions by converting optical signals into electric ones.

The unit is operated at $2.4 \sim 5.5 \text{ V}$ and the signal output interface is TTL compatible with high performance at low power consumption.

Applications

- Digital Optical Data-Link
- Dolby AC-3 Digital Audio Interface
- HDMI Digital (192kHz) Audio Interface

Absolute Maximum Ratings (Ta=25 °C)

| Parameter | Symbol | Rating | Unit |
|-----------------------|--------|-------------|------|
| Supply Voltage | Vcc | -0.5 ~ +5.5 | V |
| Output Voltage | Vout | Vcc +0.3 | V |
| Storage Temperature | Tstg | -40 to 85 | °C |
| Operating Temperature | Topr | -20 to 70 | °C |
| Soldering Temperature | Tsol | 260* | °C |
| Human Body Model ESD | HBM | 2000 | V |
| Machine Model ESD | MM | 100 | V |

Notes: Soldering time 10 seconds.

Recommended Operating Conditions

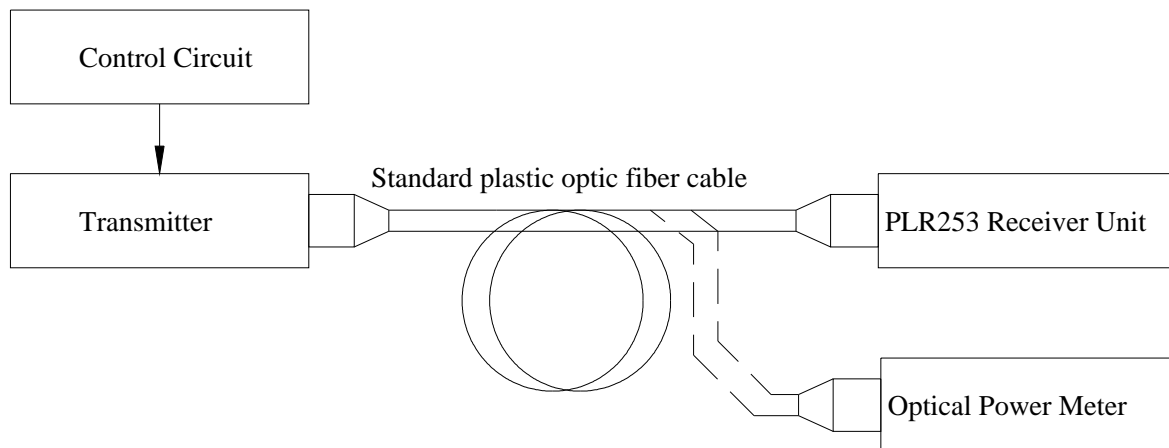
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|----------------|--------|------------|------|------|------|------|
| Supply Voltage | Vcc | - | 2.4 | 3.0 | 5.50 | V |

Electro-Optical Characteristics (Ta=25 °C, Vcc=3V, CL= 5pf)

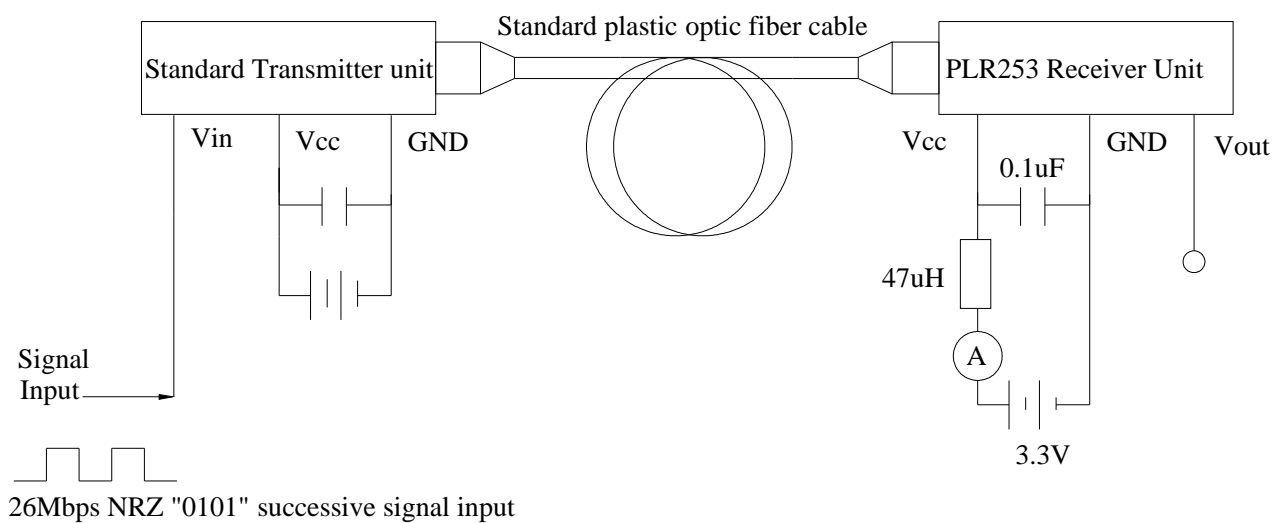
| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-------------------------------|-------------|---------------------------|------|------|------|------|
| Peak sensitivity wavelength | λ_p | - | - | 660 | - | nm |
| Transmission Distance | d | *1 | - | - | -14 | m |
| Maximum receiver power | Pc,max | Refer to Fig.1 | -27 | - | - | dBm |
| Minimum receiver power | Pc,min | Refer to Fig.1 | - | 2 | 4 | dBm |
| Dissipation current | Icc | Refer to Fig.2 | - | 3 | 6 | mA |
| High level output voltage | VOH | Refer to Fig.3 | 3.0 | 3.2 | - | V |
| Low level output voltage | VOL | Refer to Fig.3 | - | 0.2 | 0.4 | V |
| Rise time | tr | Refer to Fig.3 | - | 10 | 14 | ns |
| Fall time | tf | Refer to Fig.3 | - | 10 | 14 | ns |
| Propagation delay Low to High | tPLH | Refer to Fig.3 | - | - | 80 | ns |
| Propagation delay High to Low | tPHL | Refer to Fig.3 | - | - | 80 | ns |
| Pulse Width Distortion | Δtw | Refer to Fig.3 | -15 | - | +15 | ns |
| Jitter | Δtj | Refer to Fig.3, Pc=-14dBm | - | 1 | 5 | ns |
| | | Refer to Fig.3, Pc=-27dBm | - | 5 | 10 | ns |
| Transfer rate | T | NRZ signal | 0.1 | - | 25 | Mb/s |

Measuring Method

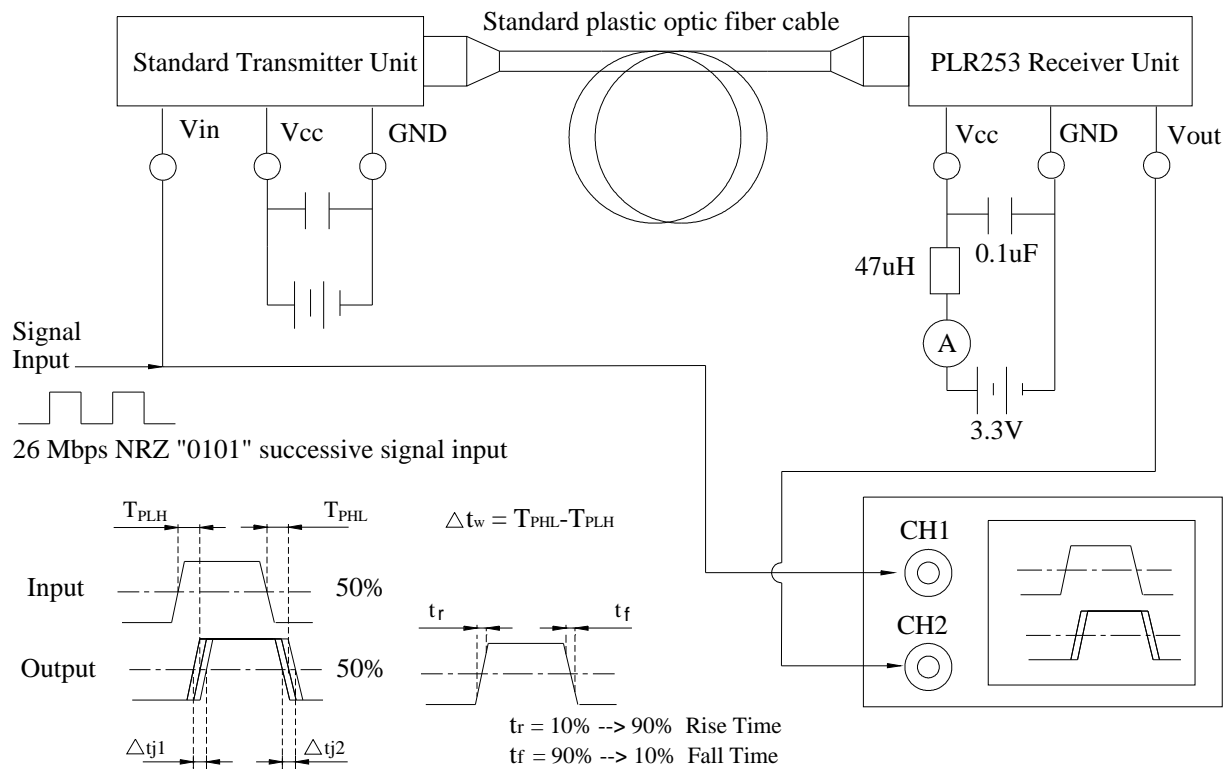
*Fig.1 Measuring Method of Maximum and Minimum Input Power that Receiver Unit Need



*Fig.2 Measuring Method of Dissipation Current

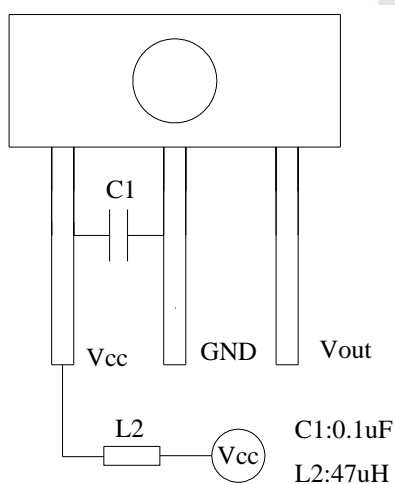


*Fig.3 Measuring Method of Output Voltage, Pulse and Jitter



Application Circuit

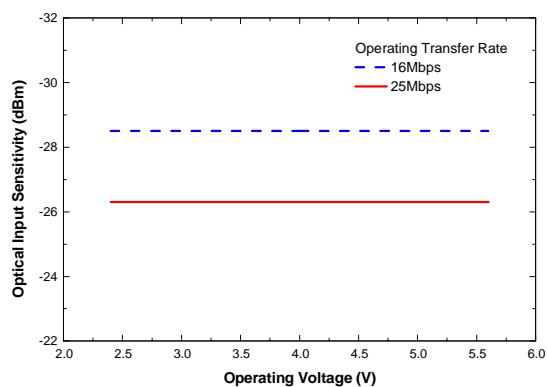
General application circuit



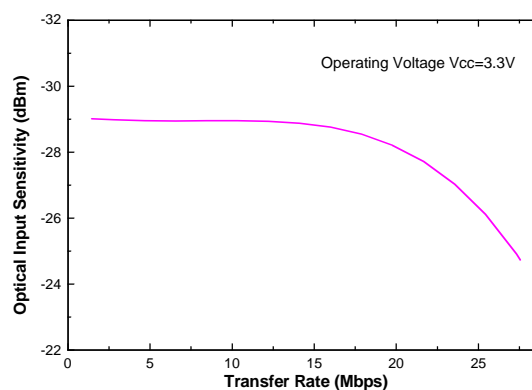
- Note:** 1. For having good coupling, the C1 capacitor must be placed within 7mm
2. For having good signal waveform, the Vout –GND circuit capacitor shall be smaller than 30pF.

Typical Electro-Optical Characteristics Curves

*Fig.4 Power supply voltage vs. Minimum receiver power

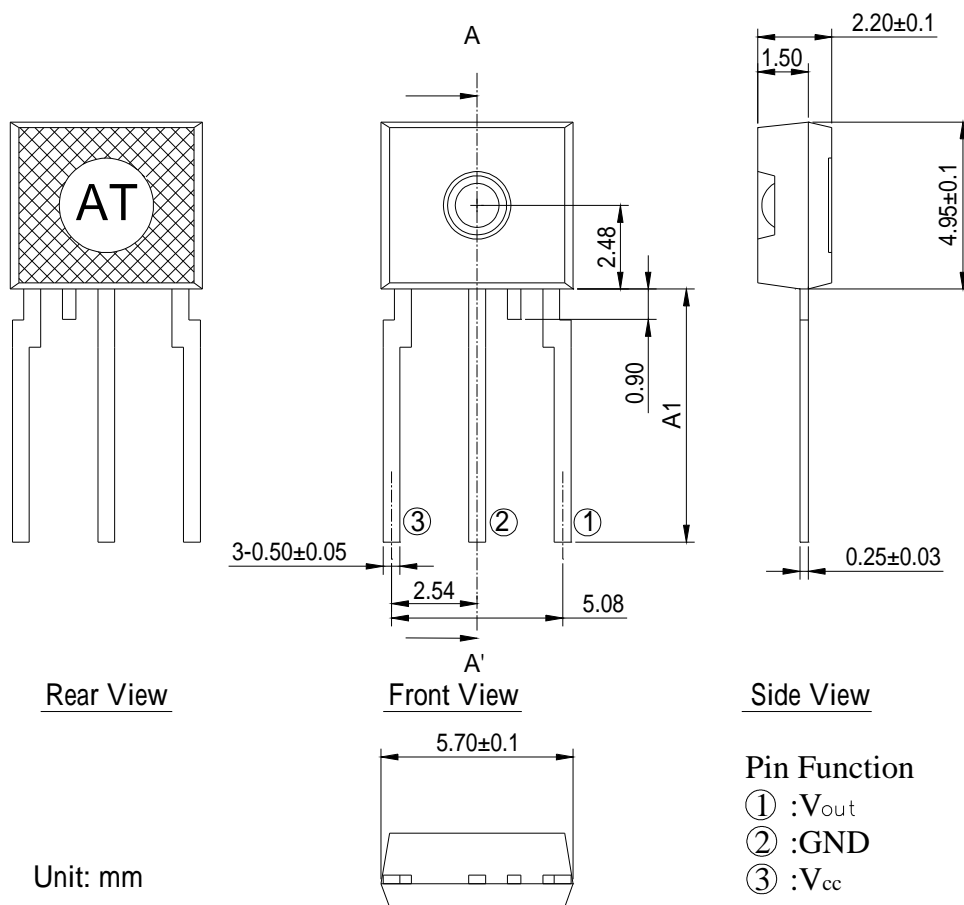


*Fig.5 Transfer rate vs. Minimum receiver power



Note: Before using the PLR233 series device, please confirm the minimum sensitivity at different operating voltage and transmission rate.

Package Dimension

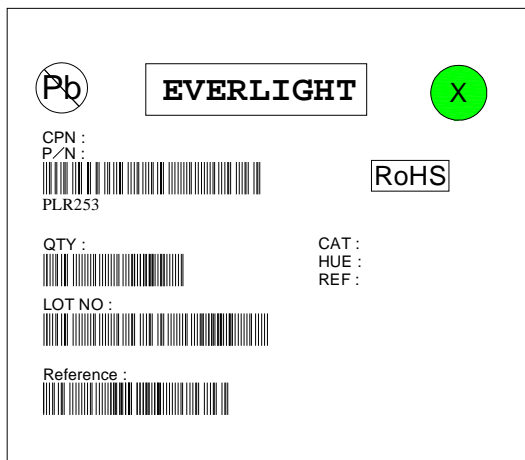


Notes:

1. All dimensions are in mm.
2. General Tolerance: ± 0.10 mm
3. Device Selection Table:

| Device Name | Pin Length A1 (mm) |
|-------------|--------------------|
| PLR253 | 12.55 ± 0.5 |
| PLR253/S1 | 7.50 ± 0.25 |
| PLR253/S5 | 16.50 Min |

Label Explanation



- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number
- X: Month
- Reference: Identify Label Number

Packing Quantity Specification

1. 500 or 1000 pcs/bag
2. 4 bag/box

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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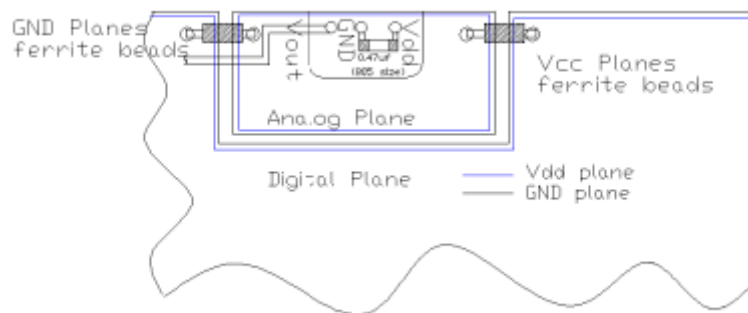
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Application Notes: PLR253 Series PCB layout for motherboard integration

To achieve better jitter and low input optical power performances, several PCB layout guidelines must be followed. These guidelines ensure the most reliable PLR253 series POF performance for the motherboard integration. Failed to implement these PCB guidelines may affect the PLR253 jitter and low input power performances.

1. Careful decoupling of the power supplies is very important. Place a 0.1uf surface mount (size 805 or smaller) capacitor as close as (less than 2cm) to the POF Vdd and Gnd leads. The 0.1uf act as a low impedance path to ground for any stray high frequency transient noises.
2. To reduce the digital noises form the digital IC on the motherboard, the planar capacitance formed by an isolated Vcc and Gnd planes is critical. The POF device must be mounted directly on these two planes to reduce the lead parasitic inductance.
3. The isolated Vdd and Gnd planes must be connected to the main Vcc and Gnd (digital) planes at a single point using ferrite beads. The beads are used to block the high frequency noises from the digital planes while still allowing the DC connections between the planes



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