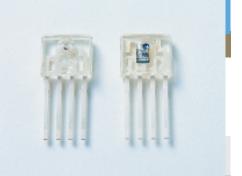
# Red LED/Photo IC for optical link L7726/S7727



# Emitter/receiver for 156 Mbps POF communications

L7726 and S7726 are designed for high-speed POF (Plastic Optical Fiber) communications. Both devices are molded into miniature plastic packages with lenses, allowing easy and efficient coupling to a POF. S7727 uses a monolithic photo IC that ensures high resistance to external noise and high reliability, and provides P-ECL voltage conversion output.

#### **Features**

#### L7726

- Red LED for POF data link
- 650 nm emission suitable for POF communications
- High-speed response: fc=100 MHz Typ.
- ◆ High output power: Po= -1.5 dBm (IF=30 mA, \$\phi1\$ mm, POF)

#### S7727

- Photo IC receiver for POF data link
- Monolithic structure immune from external noise
- Data rates from 4 Mbps to 156 Mbps
- P-ECL voltage conversion output (Note: Unlike normal P-ECL output, S7727 output cannot be terminated with 50 Ω.)

### Applications

- Plastic optical fiber communications (FA, office machine, home automation, LAN)
- Data transmission in locations subject to high electromagnetic noise

## L7726

#### ■ Absolute maximum ratings (Ta=25 °C)

| Parameter             | Symbol | Value  | Unit |
|-----------------------|--------|--|------|
| Forward current       | lF     | 50   | mA   |
| Power dissipation     | Pmax   | 250 <sup>*1</sup>                                      | mW   |
| Operating temperature | Topr   | 0 to 60  | °C   |
| Storage temperature   | Tstg   | -40 to +85   | °C   |
| Soldering             | -      | 230 °C, 5 s, at least 1.5 mm away from package surface | -    |

<sup>\*1:</sup> Derate power dissipation at a rate of 1.7 mW/°C above Ta=25 °C

#### ■ Electrical and optical characteristics (Ta=25 °C)

| Parameter                   | Symbol | Condition             | Min. | Тур. | Max. | Unit |
|-----------------------------|--------|-----------------------|------|------|------|------|
| Forward voltage             | VF     | IF=30 mA              | -    | 2.3  | -    | V    |
| Peak emission wavelength    | λр     | IF=30 mA              | 640  | 650  | 660  | nm   |
| Spectral half width (FWHM)  | Δλ     | I <sub>F</sub> =30 mA | -    | 10   | -    | nm   |
| Fiber coupled optical power | Po     | IF=30 mA *2           | -    | -1.5 | -    | dBm  |
| Cut-off frequency           | fc     | IF=30 mA              | -    | 100  | -    | MHz  |

<sup>\*2:</sup> Measured using a 1-meter long optical fiber (MH4001 made by Mitsubishi Rayon).



#### S7727

■ Absolute maximum ratings (Ta=25 °C)

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|--------------------------------|--------|--|------|
| Parameter                      | Symbol | Value  | Unit |
| Supply voltage                 | Vcc    | -0.5 to +7.0   | V    |
| Output voltage                 | Vo     | -0.5 to Vcc + 0.5                                      | V    |
| Output current                 | lo     | 8  | mA   |
| Power dissipation              | Pmax   | 250 <sup>*3</sup>                                      | mW   |
| Operating temperature          | Topr   | -20 to +70   | °C   |
| Storage temperature            | Tstg   | -40 to +85   | °C   |
| Soldering                      | -      | 230 °C, 5 s, at least 1.5 mm away from package surface | -    |

<sup>\*3:</sup> Derate power dissipation at a rate of 1.7 mW/°C above Ta=25 °C

■ Electrical and optical characteristics (Ta=25 °C, Vcc=5.0 V)

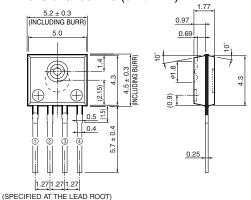
| Parameter                    | Symbol | Condition                      | Min. | Тур. | Max. | Unit |
|------------------------------|--------|--------------------------------|------|------|------|------|
| Data rate                    | fD     | Bi-phase signal NRZ conversion | 4    | -    | 156  | Mbps |
| Current consumption          | Icc    | *4, *5, *8                     | -    | -    | 40   | mA   |
| High level output voltage    | Voh    | loh= -1 mA *4, *5, *8          | 3.9  | -    | 4.3  | V    |
| Low level output voltage     | Vol    | Iol= -0.5 μA *4, *5, *8        | 2.9  | -    | 3.4  | V    |
| Minimum overload             | Pimax  | *4, *5, *6, *7, *8             | -2   | -    | -    | dBm  |
| Minimum receiver input power | Pimin  | *4, *5, *6, *7, *8             | -    | -    | -22  | dBm  |
| Rise time                    | tr     | 10 to 90 % *4, *5, *8          | -    | -    | 3    | ns   |
| Fall time                    | tf     | 7101090%                       | -    | -    | 3    | ns   |
| Pulse width distortion       | ΔΤ     | *4, *5, *6, *8                 | -3   | -    | 3    | ns   |
| Jitter                       | Δtj    | *4, *5, *6, *8                 | -    | -    | 3    | ns   |

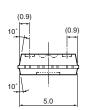
<sup>\*4:</sup> Measured with 156 Mbps input signal (Bi-phase signal)

#### Note)

- A bypass capacitor (0.1 μF) connected at a position within 2 mm from the lead, and a 4.7 μF capacitor is also connected to the power supply line nearby.
- The optical axis of the package lens is exactly aligned with the center axis of the optical plug, and the gap between the lens surface and the optical reference plane of the plug is 0.1 mm.
- If modulated light at 4 Mbps or less (including DC light and no light input) is input to S7727, the high and low levels cannot be discerned.

#### ■ Dimensional outline (unit: mm)





| PIN No. | L7726   | S7727 |  |
|---------|---------|-------|--|
| 1       | CATHODE | QB    |  |
| 2       | CATHODE | GND   |  |
| 3       | ANODE   | Q     |  |
| 4       | CATHODE | Vcc   |  |

Tolerance unless otherwise noted:  $\pm 0.1$ ,  $\pm 2^{\circ}$  Shaded area indicates burr. Values in parentheses indicate reference value.

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<sup>\*5:</sup> A 3 pF capacitor is connected to GND as a capacitive load (including parasitic capacitance such as probes, connectors and evaluation PCB patterns)

<sup>\*6:</sup> An optical input waveform is generated with a Hamamatsu standard transmitter.

<sup>\*7:</sup> A detectable signal level is an average value, measured using a plastic fiber (MH4001 made by Mitsubishi Rayon).

<sup>\*8:</sup> A 3 k $\Omega$  resistor is externally connected between Q and GND and also between QB and GND.