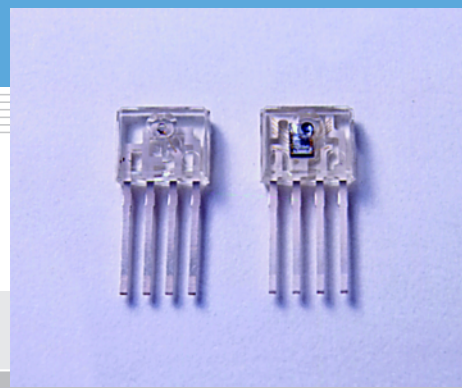


# Red LED/Photo IC for optical link

## 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:  $f_c=100$  MHz Typ.
- High output power:  $P_o = -1.5$  dBm ( $I_F=30$  mA,  $\phi 1$  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  $50\ \Omega$ .)

#### Applications

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

#### L7726

##### ■ Absolute maximum ratings ( $T_a=25\ ^\circ\text{C}$ )

Parameter	Symbol	Value	Unit
Forward current	$I_F$	50	mA
Power dissipation	$P_{max}$	250 <sup>*1</sup>	mW
Operating temperature	$T_{opr}$	0 to 60	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-40 to +85	$^\circ\text{C}$
Soldering	-	230 $^\circ\text{C}$ , 5 s, at least 1.5 mm away from package surface	-

\*1: Derate power dissipation at a rate of 1.7 mW/ $^\circ\text{C}$  above  $T_a=25\ ^\circ\text{C}$

##### ■ Electrical and optical characteristics ( $T_a=25\ ^\circ\text{C}$ )

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	$V_F$	$I_F=30$ mA	-	2.3	-	V
Peak emission wavelength	$\lambda_p$	$I_F=30$ mA	640	650	660	nm
Spectral half width (FWHM)	$\Delta\lambda$	$I_F=30$ mA	-	10	-	nm
Fiber coupled optical power	$P_o$	$I_F=30$ mA <sup>*2</sup>	-	-1.5	-	dBm
Cut-off frequency	$f_c$	$I_F=30$ mA	-	100	-	MHz

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

**S7727****■ Absolute maximum ratings (Ta=25 °C)**

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	Io	8	mA
Power dissipation	Pmax	250 *3	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	-

\*3: 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.	Typ.	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	Ioh= -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
Maximum detectable signal level	Pimax	*4, *5, *6, *7, *8	-2	-	-	dBm
Minimum detectable signal level	Pimin	*4, *5, *6, *7, *8	-	-	-22	dBm
Rise time	tr	10 to 90 % *4, *5, *8	-	-	3	ns
Fall time	tf		-	-	3	ns
Pulse width distortion	ΔT	*4, *5, *6, *8	-3	-	3	ns
Jitter	Δtj	*4, *5, *6, *8	-	-	3	ns

\*4: Measured with 156 Mbps input signal (Bi-phase signal)

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

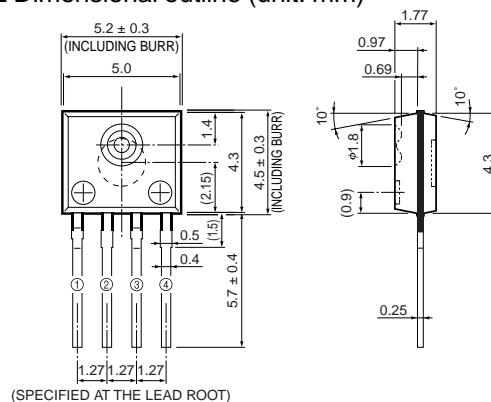
\*6: An optical input waveform is generated with a Hamamatsu standard transmitter.

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

\*8: A 3 kΩ resistor is externally connected between Q and GND and also between QB and GND.

**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: ±0.1, ±2°  
Shaded area indicates burr.  
Values in parentheses indicate reference value.

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