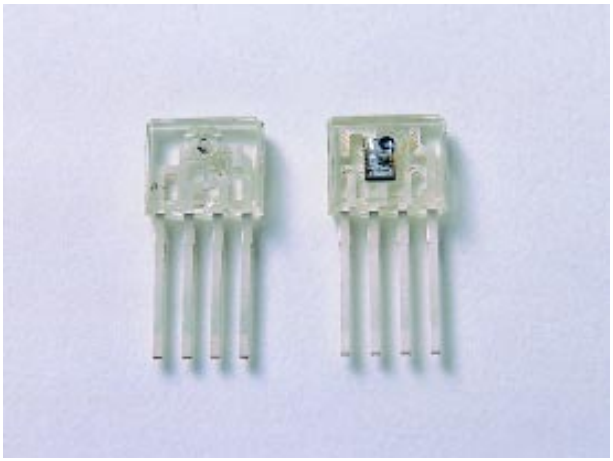
PHOTO IC/RED LED FOR OPTICAL DATA LINKS

S7727, L7726

Receiver/emitter for 156 Mbps POF (plastic optical fiber) data links



FEATURES

- **L7726:** Red LED for POF (plastic optical fiber) data links
  - 650 nm emission suitable for POF communications
  - High-speed response: fc=100 MHz Typ.
  - High output power: Po= -1.5 dBm (If=30 mA, 1 mm dia. POF)
- **S7727:** Photo IC for POF (plastic optical fiber) data links
  - Monolithic structure immune from external noise
  - Data rates from 4 Mbps to156 Mbps
  - P-ECL voltage conversion output

APPLICATIONS

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

Hamamatsu offers a photo IC and a red LED ideally suited for high-speed POF (plastic optical fiber) communications. Both devices are molded into miniature plastic packages with non-spherical lenses, allowing easy and efficient coupling to a POF. The S7727 uses a monolithic photo IC that ensures high resistance to external noise and high reliability, and provides P-ECL voltage conversion output. It should be noted that the S7727 does not have a normal P-ECL output and cannot be terminated with 50 ohms.

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
Allowable Power Dissipation	Pmax	250 *1	mW
Operating Temperature	Topr	-20 to +70	°C
Storage Temperature	Tstg	-40 to +85	°C

■ ELECTRICAL AND OPTICAL CHARACTERISTICS (Ta=25 °C, Vcc=5.0 V)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Data Rate	f_D	Bi-phase signal NRZ conversion	4	-	156	Mbps
Current Consumption	Icc	*2, *3, *6	-	-	40	mA
High Level Output Voltage	Voh	Ioh= -1 mA *2, *3, *6	3.9	-	4.3	V
Low Level Output Voltage	Vol	Iol= -0.5 μA *2, *3, *6	2.9	-	3.4	V
Max. Detectable Signal Level	Pimax	*2, *3, *4, *5, *6	-2	-	-	dBm
Min. Detectable Signal Level	Pimin	*2, *3, *4, *5, *6	-	-	-22	dBm
Rise Time	tr	10-90 % *2, *3, *6	-	-	3	ns
Fall time	tf		-	-	3	ns
Pulse Width Distortion	ΔT	*2, *3, *4, *6	-3	-	3	ns
Jitter	Δtj	*2, *3, *4, *6	-	-	3	ns

*1: Allowable power dissipation should be derated at a rate of 1.7 W/°C above Ta=25 °C.
*2: Measurement at input signal at 156 Mbps (Bi-phase signal)
*3: A 3 pF capacitor is connected to GND as a capacitive load (including parasitic capacitance such as probes, connectors, and PCB patterns)
*4: An optical input waveform is generated with a Hamamatsu standard transmitter.
*5: A detectable signal level is an average value, measured using a plastic fiber (MH4001 made by Mitsubishi Rayon).
*6: A 3 kΩ resistor is externally connected to Q and QB respectively.

L7726 Under development

■ ABSOLUTE MAXIMUM RATINGS (Ta=25 °C)

Parameter	Symbol	Value	Unit
Forward Current	If	50	mA
Allowable Power Dissipation	Pmax	250 *1	mW
Operating Temperature	Topr	0 to 60	°C
Storage Temperature	Tstg	-40 to +85	°C

■ ELECTRICAL AND OPTICAL CHARACTERISTICS (Ta=25 °C)

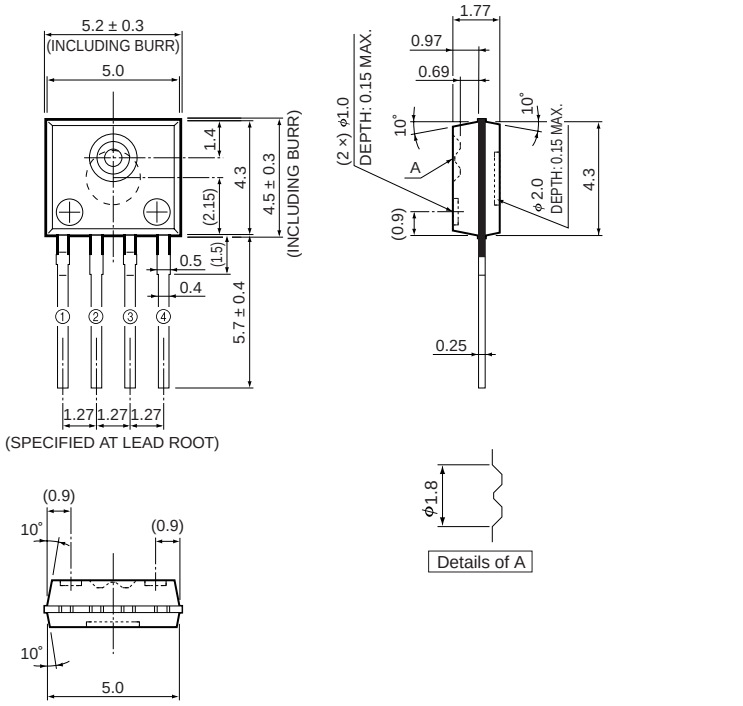
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	Vf	If=30 mA	-	2.3	-	V
Peak Emission Wavelength	λp	If=30 mA	640	650	660	nm
Spectral Width (FWHM)	Δλ	If=30 mA	-	10	-	nm
Fiber Coupled Optical Power	Po	If=30 mA *7	-	-1.5	-	dBm
Cutoff Frequency	fc	If=30 mA	-	100	-	MHz

*7: Measurement at a 1-meter long optical fiber (MH4001 made by Mitsubishi Rayon).

NOTES

- A bypass capacitor (0.1 μF) is connected to the lead at a position within 2 mm from the lead end, and a 4.7 μF capacitor is also connected nearby the power supply line.
- The optical axis of the package lens is exactly aligned with the axis of the optical plug, and the gap between the lens surface and the plug is 0.1 mm.
- If modulated light at 4 Mbps or less (including DC light and no light input) is input to the receiver device, 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 specified: ±0.1, ±2°
Bold line dimensions include plastic burr.
Values in parentheses are not guaranteed, but only for reference.

KPICA0029EA