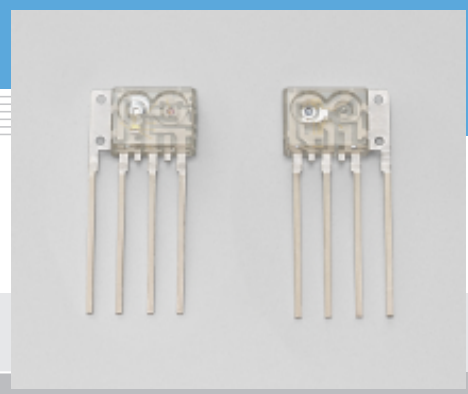


Transmitter/receiver photo IC for optical link

L8628, S8627-01A

For MOST automotive network, 50 Mbps band POF communications



L8628 and S8627-01A are transmitter and receiver photo ICs developed for MOST (Media Oriented System Transport) networks used in vehicles to communicate multimedia information. The transmitter photo IC L8628 consists of a red LED, driver IC and current regulator chip incorporated into a clear plastic package and can be set to an operating mode that reduces the optical output level by half. The receiver photo IC S8627-01A is a monolithic photo IC fabricated by the PiN-BiP process and features a wide dynamic range. It also has a low power consumption "sleeping mode" and an optical wakeup mode triggered by input of light. Both the transmitter and receiver photo IC input and output digital signals through a TTL interface.

Features

L8628

- DC to 50 Mbps data communications
- TTL input
- Optical output 50 % cut mode

S8627-01A

- 4 M to 50 Mbps data communications
- Monolithic structure immune from external noise
- TTL output
- Wide dynamic range
- Sleeping mode with optical wakeup
- Absolute maximum ratings (Ta= 25 °C)

Applications

- Only for vehicle networks (MOST)

Specifications of these products are subject to change without prior notice to keep up with changes in the MOST standard.

Parameter	Symbol	L8628, S8627-01A	Unit
Supply voltage	Vcc	-0.5 to +7.0	V
Operating temperature	Topr	-40 to +85	°C
Storage temperature	Tstg	-40 to +100	°C
Soldering	Tsol	260 °C, 5 s, 3 times, at least 2.5 mm away from lead root	°C

S8627-01A

■ Electrical and optical characteristics (Ta= -40 to +85 °C, Vcc=4.75 to 5.25 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption (operation mode)	Icco	*1, *2	-	-	30	mA
Current consumption (sleeping mode)	Iccs	Dark state	-	-	30	μA
Receiver level	Popt3	Bi-phase signal	-24	-	-3.5	dBm
Vout	High level output voltage	Voh loh= -150 μm	2.5	-	-	V
	Low level output voltage	Vol loh=1.6 mA	-	-	0.4	V
	Rise time	tr 10 to 90 % *1, *2	-	-	9	ns
	Fall time	tf	-	-	7	ns
Pulse width variation	tpwv	*1, *2, *3, *5	18	-	29.8	ns
Pulse width distortion (average value)	tapwd	*1, *2, *3, *5	-1.8	-	+6.6	ns
Operation to sleeping mode transition receivable level	PsI	*1, *2, *4	-39	-	-25.5	dBm
Sleeping mode to operation transition receivable level	Pop					
Mode out	High level voltage	Vmh loh= -20 μA	4.0	-	-	V
	Low level voltage	Vml loh=0.88 mA	-	-	0.5	V

*1: Measured with input signals conforming to SP3 MOST specification of physical layer rev. 1.0.

*2: Measured with RL=50 kΩ, CL=15 pF (including parasitic capacitance such as probe, connector and evaluation circuit board pattern), and threshold voltage=1.5 V.

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

*4: Average optical power is measured with a POF (NA=0.5).

*5: Measured with BiPhase PRBS at 45.2 Mbps (NRZ signal conversion).

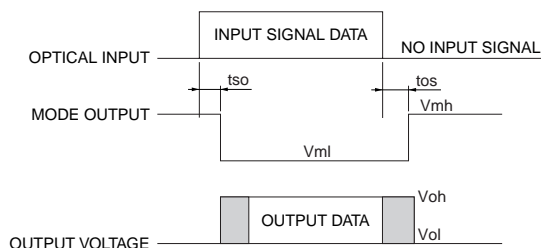
Note) • If modulated light at 4 Mbps or less (including DC light and no light input) is input to S8627, the high and low levels cannot be discerned.

- A bypass capacitor (0.1 μF) connected between Vcc and GND at a position within 3 mm from the lead, and a 10 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.

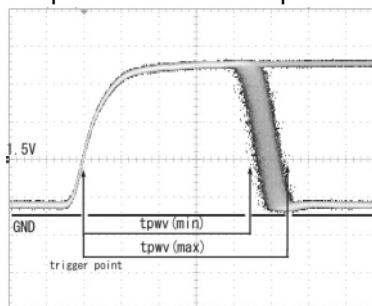
SOLID STATE DIVISION

Mode output waveform



KPIC00095EA

Output waveform example



Vertical axis: 1 V/div., Horizontal axis: 5 ns/div.
(Ta=25 °C, Vcc=5.25 V, Pi= -26 dBm,
RL=50 kΩ, CL=15 pF, 45.2 Mbps)

L8628

Electrical and optical characteristics (Ta= -40 to +85 °C, Vcc= 4.75 to 5.25 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption	Icc	Vin= 2.0 V, Rcont=13.5 kΩ	-	-	40	mA
Peak emission wavelength	λ_p		630	650	670	nm
Spectral half width (FWHM)	$\Delta\lambda$		-	20	30	nm
Fiber coupled optical power 1	Po1	Rcont=13.5 kΩ *6, *7	-8.5	-	-2.5	dBm
Fiber coupled optical power 2	Po2	Rcont=27 kΩ *6, *7	-11.8	-	-5.2	dBm
Extinction ratio	re		10	-	-	dB
Rise time at pulse drive	tr	20 to 80 % *6	-	-	6.0	ns
Fall time at pulse drive	tf	80 to 20 % *6	-	-	6.0	ns
Pulse width variation	tpwv	50 % *6, *8	20.9	-	24.3	ns
Pulse width distortion (average value)	tapwd	50 % *6, *8	-0.5	-	+1.5	ns

*6: Measured with input signals conforming to SP1 MOST specification of physical layer rev. 1.0.

*7: Average value measured with a plastic fiber (φ1 mm, SI-POF, NA=0.5, 1 m) made by Mitsubishi Rayon.

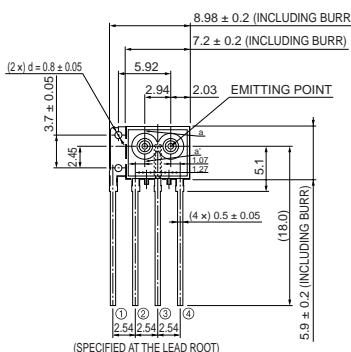
*8: Measured with BiPhase PRBS at 45.2 Mbps (NRZ signal conversion).

NOTE) • A bypass capacitor (0.1 μF) connected between Vcc and GND at a position within 3 mm from the lead, and a 10 μF capacitor is also connected to the power supply line nearby.

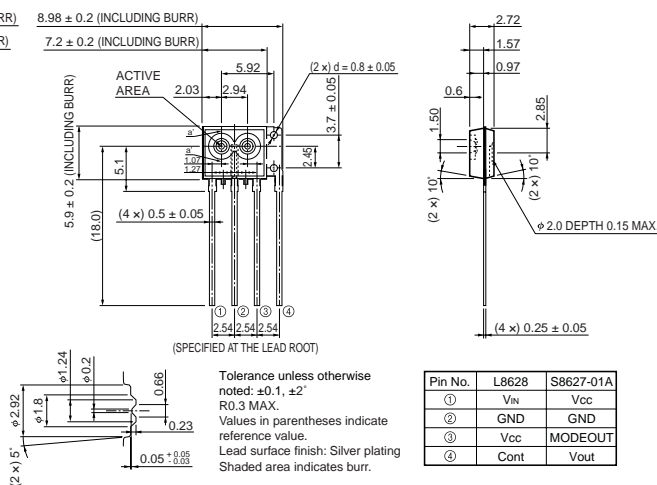
• The optical axis of the package lens is exactly aligned with the center axis of the optical plug, and the gap between the lens surface and the optical reference plane of the plug is 0.1 mm.

Dimensional outlines (unit: mm)

L8628



S8627-01A



a-a' CROSS SECTION

KPICA0046EC

Pin No.	L8628	S8627-01A
①	Vin	Vcc
②	GND	GND
③	Vcc	MODEOUT
④	Cont	Vout

HAMAMATSU

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Hamamatsu City, 435-8558 Japan, Telephone: (81) 053-434-3311, Fax: (81) 053-434-5184, <http://www.hamamatsu.com>

U.S.A.: Hamamatsu Corporation, 360 Foothill Road, P.O.Box 6910, Bridgewater, N.J. 08807-0910, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 08152-3750, Fax: (49) 08152-2658

France: Hamamatsu Photonics France S.A.R.L.: 8, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171 41 Solna, Sweden, Telephone: (46) 8-509-031-00, Fax: (46) 8-509-031-01

Italy: Hamamatsu Photonics Italia S.R.L.: Strada della Moia, 1/E, 20020 Arese, (Milano), Italy, Telephone: (39) 02-935-81-733, Fax: (39) 02-935-81-741

Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications are subject to change without notice. No patent rights are granted to any of the circuits described herein. ©2003 Hamamatsu Photonics K.K.