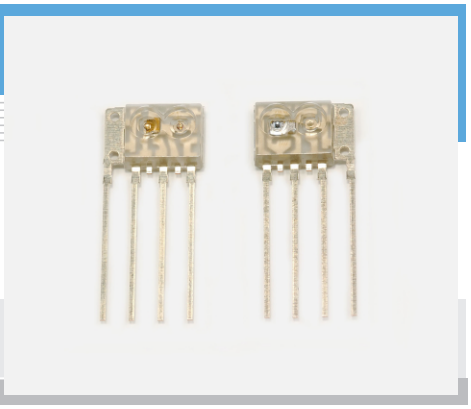
Transmitter/Receiver photo IC for optical link

L10063-01, S10064-01B

For MOST automotive network, 50 Mbps band POF communications



L10063-01 and S10064-01B 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 L10063-01 consists of a red LED and driver IC 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 S10064-01B 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 or output digital signals through a TTL interface.

Features

L10063-01

- Wide operating temperature range: -40 to +105 ˚C
- DC to 50 Mbps data communications
- TTL input
- Optical output 50 % cut mode

S10064-01B

- Wide operating temperature range: -40 to +105 ˚C
- 4 M to 50 Mbps data communications
- Monolithic structure immune from external noise
- TTL output
- Wide dynamic range
- Sleeping mode with optical wakeup

Applications

- Only for vehicle networks (MOST)

MOST compliant products

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

■ Absolute maximum ratings *1 (Ta= -40 to +105 °C)

Parameter	Symbol	L10063-01, S10064-01B	Unit
Supply voltage	Vcc	-0.5 to +7.0	V
Operating temperature	Topr	-40 to +105	°C
Storage temperature	Tstg	-40 to +120	°C
Soldering	Tsol	260 °C, 5 s, 3 times, at least 2.5 mm away from lead root	-

S10064-01B

■ Electrical and optical characteristics (Ta= -40 to +105 °C, Vcc=4.75 to 5.25 V *1)

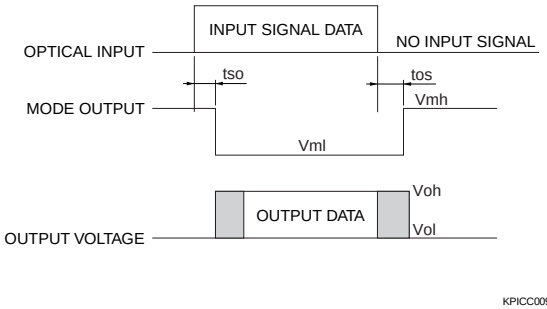
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption (operation mode)		Icco	*2	-	-	30	mA
Current consumption (sleeping mode)		Iccs	Dark state	-	-	20	µA
Receiver level		Popt3	Bi-phase signal	-25	-	-2	dBm
Vout	High level output voltage	Voh	Ioh= -150 µm	2.5	-	Vcc+0.3	V
	Low level output voltage	Vol	Iol=1.6 mA	0	-	0.4	V
	Rise time	tr	10 to 90 % *2, *3	-	-	9	ns
	Fall time	tf		-	-	7	
Pulse width variation		tpwv	*2, *3, *4, *6	17.9	-	29.79	ns
Pulse width distortion (average value)		tapwd	*2, *3, *4, *6	-2.69	-	+6.49	ns
Operation to sleeping mode transition receivable level		Psl	*2, *5	-39	-	-25.5	dBm
Sleeping mode to operation transition receivable level		Pop					
Mode output	High level voltage	Vmh	Imh= -20 µA	4.0	-	-	V
	Low level voltage	Vml	Iml=0.88 mA	-	-	0.5	V

*1: A bypass capacitor (0.1 µF) is 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 center of the optical fiber is aligned with the center of the package lens.
The distance between the fiber end and the lens top is 0.1 mm.
*2: Measured with input signals conforming to SP3 MOST specification of physical layer Rev 1.1 Addendum B.
*3: Measured with R_L=50 kΩ, C_L=15 pF (including parasitic capacitance such as probe, connector and evaluation circuit board pattern), and threshold voltage 1.5 V.
*4: An optical input waveform is generated with a Hamamatsu standard transmitter.
*5: Average optical output is measured with a POF (NA=0.5).
*6: 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 S10064-01B, the high and low levels cannot be discerned.

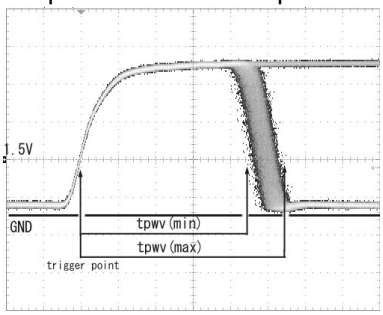
SOLID STATE DIVISION

■ Mode output waveform



KPICC0095EA

■ Output waveform example



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

L10063-01

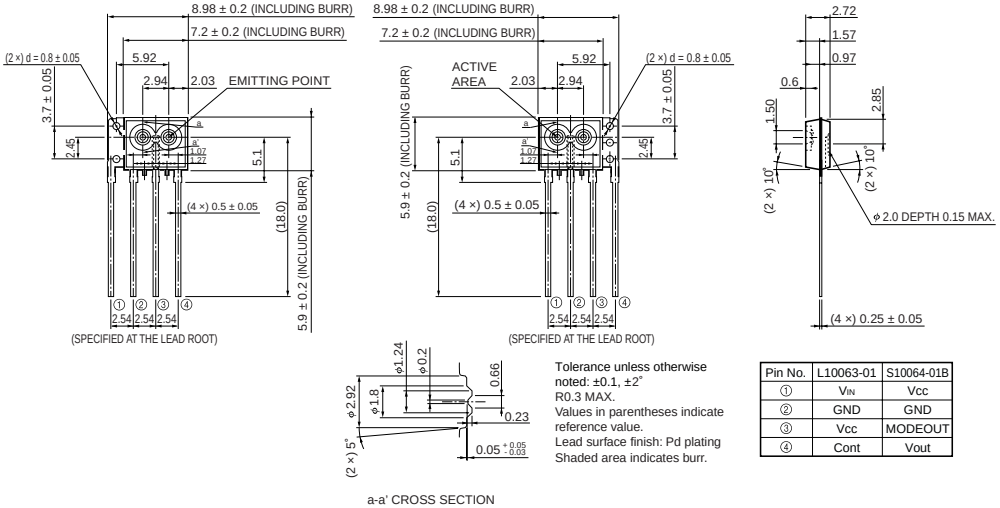
■ Electrical and optical characteristics (Ta= -40 to +105 °C, Vcc= 4.75 to 5.25 V *7)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption	Icc	Vin= 2.0 V, Rcont=13.5 kΩ	-	-	40	mA
Peak emission wavelength	λp		630	650	670	nm
Spectral half width (FWHM)	Δλ		-	20	30	nm
Fiber coupled optical output 1	Po1	Rcont=13.5 kΩ *8, *9	-9	-	-2	dBm
Fiber coupled optical output 2	Po2	Rcont=27 kΩ *8, *9	-12.5	-	-4.5	dBm
Extinction ratio	re		10	-	-	dB
Rise time at pulse drive	tr	20 to 80 % *8	-	-	6.0	ns
Fall time at pulse drive	tf	80 to 20 % *8	-	-	6.0	ns
Pulse width variation	tpwv	50 % *8, *10	19.99	-	24.29	ns
Pulse width distortion (average value)	tapwd	50 % *8, *10	-1.39	-	+1.39	ns

*7: 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 center of the optical fiber is aligned with the center of the package lens.
The distance between the fiber end and the lens top is 0.1 mm.
*8: Measured with input signals conforming to SP1 MOST specification of physical layer Rev 1.1 Addendum B.
*9: Average value measured with a plastic fiber (ϕ1 mm, SI-POF, NA=0.5, 1 m) made by Mitsubishi Rayon.
*10: Measured with BiPhase PRBS at 45.2 Mbps (NRZ signal conversion).

■ Dimensional outlines (unit: mm)

L10063-01 | S10064-01B



Tolerance unless otherwise noted: ±0.1, ±2°
R0.3 MAX.
Values in parentheses indicate reference value.
Lead surface finish: Pd plating
Shaded area indicates burr.

Pin No.	L10063-01	S10064-01B
①	V_{IN}	Vcc
②	GND	GND
③	Vcc	MODEOUT
④	Cont	Vout

KPICA0067EB

HAMAMATSU
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. ©2008 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K., Solid State Division
1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184, 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.: 19, 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

Cat. No. KPIC1065E02
Mar. 2008 DN