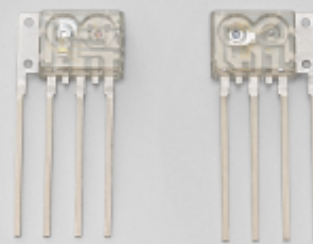


Transmitter/receiver photo IC for optical link

L8628/S8627

For MOST automotive network, 50 Mbps band POF communications



L8628 and S8627 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 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

- 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)

Parameter	Symbol	L8628/S8627	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

Applications

- Vehicle networks (MOST)
- Factory automation networks
- Office machine networks
- Data communications requiring high reliability due to locations with excessive noise

S8627

■ 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	-25	-	-2	dBm
Vout	High level output voltage	Voh Ioh= -150 μm	2.5	-	-	V
	Low level output voltage	Vol Iol=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	15.5	-	32.7	ns
Pulse width distortion (average value)	tapwd	*1, *2, *3, *5	0	-	+8	ns
Operation to sleeping mode transition receivable level	PsI	*1, *2, *4	-40	-	-28	dBm
Sleeping mode to operation transition receivable level	Pop					
Mode out	High level voltage	Vmh Ioh= -20 μA	4.0	-	-	V
	Low level voltage	Vml Iol=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).

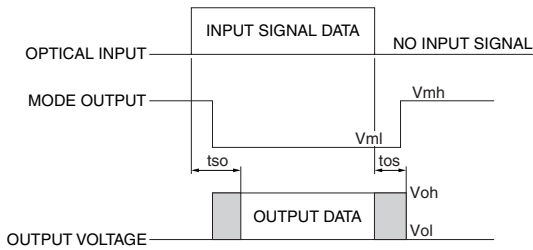
*5: Measured with PRBS at 45.2 Mbps (NRZ signal conversion).

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.

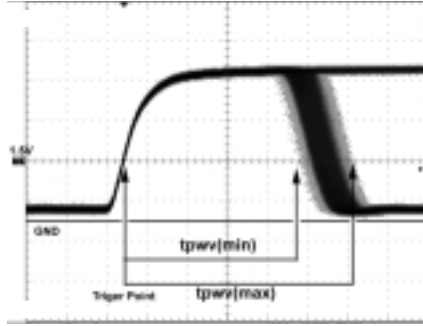
- The optical axis of the package lens is exactly aligned with the center axis of the optical plug, and the gap between the lens surface and the optical reference plane of the plug is 0.1 mm.

Mode output waveform



KPIC0085EA

Output waveform example



Vertical axis: 1 V/div., Horizontal axis: 5 ns/div.
($T_a=25^\circ\text{C}$, $V_{cc}=5.0\text{ V}$, $P_i=-26\text{ dBm}$)

L8628

Electrical and optical characteristics ($T_a=-40$ to $+85^\circ\text{C}$, $V_{cc}=4.75$ to 5.25 V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption	I_{cc}	$V_{in}=2.0\text{ V}$, $R_{cont}=13.5\text{ k}\Omega$	-	-	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	P_{o1}	$R_{cont}=13.5\text{ k}\Omega$ *6, *7	-8.5	-	-2.5	dBm
Fiber coupled optical power 2	P_{o2}	$R_{cont}=27\text{ k}\Omega$ *6, *7	-11.8	-	-5.2	dBm
Extinction ratio	re		10	-	-	dB
Rise time at pulse drive	t_r	20 to 80 % *6	-	-	6.0	ns
Fall time at pulse drive	t_f	80 to 20 % *6	-	-	6.0	ns
Pulse width variation	t_{pwv}	50 % *6, *8	20.9	-	24.3	ns
Pulse width distortion (average value)	t_{apwd}	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 ($\phi 1\text{ mm}$, SI-POF, $NA=0.5$, 1 m) made by Mitsubishi Rayon.

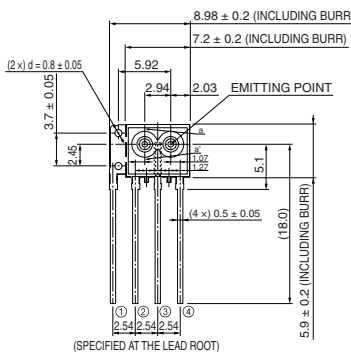
*8: Measured with PRBS at 45.2 Mbps (NRZ signal conversion).

(NOTE) • A bypass capacitor ($0.1\text{ }\mu\text{F}$) connected between V_{cc} and GND at a position within 3 mm from the lead, and a $10\text{ }\mu\text{F}$ capacitor is also connected to the power supply line nearby.

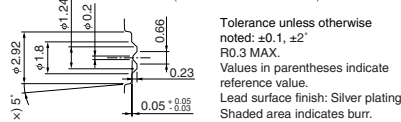
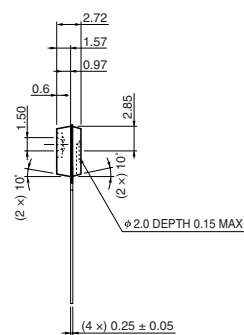
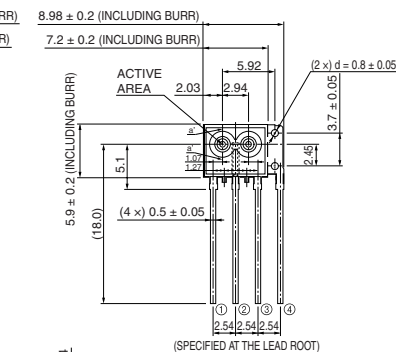
• The optical axis of the package lens is exactly aligned with the center axis of the optical plug, and the gap between the lens surface and the optical reference plane of the plug is 0.1 mm.

Dimensional outlines (unit: mm)

L8628



S8627



a-a' CROSS SECTION

Pin No.	L8628	S8627
①	V_{in}	V_{cc}
②	GND	GND
③	V_{cc}	MODEOUT
④	Cont	V_{out}

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