High Voltage / High Speed Opto-Isolator

OPI1268S



Features:

- 20 kVDC Isolation
- 2 Mbit/s transfer rate
- t_{PHL}-t_{PLH} ≤ 50 ns typical
- Creepage path: 24 mm
- TTL Compatible
- 6 Axis / 10 G_{RMS} load rating

Certifications:

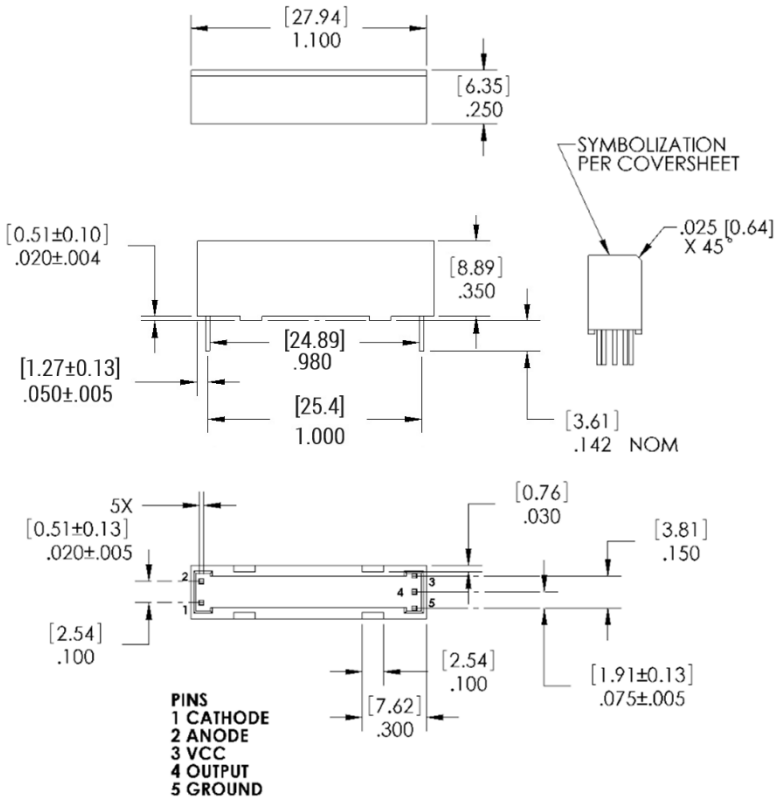
- UL File E58730
- ATEX Certification Ex ia IIc Ga
- EN IEC 60079-0:2018
- EN 60079-11:2012 (IEC 60079-11:2011 Edition 6)
- IP65 Rated

Description:

The **OPI1268S** is a high voltage isolator with a digital output that is capable of high-speed data transmission. The input of the OPI1268S consists of a high-efficiency GaAlAs LED with a peak wavelength of 850 nm, which is optically coupled to the output optical IC. A photodiode device in the output IC detects the incoming modulated light and converts it to a proportionate current. This current is fed into a high-gain linear amplifier which is temperature, current and voltage compensated. The result is a highly stable digital output with an open collector inverter configuration. This device produces DC and AC voltage isolation between the input and output circuitry while providing TTL signal integrity.

Applications:

- Transportation Systems
- Printed Circuit Board Power Systems
- Hybrid Vehicle Systems
- Medical Systems
- Control Systems



NOTE:

1. DIMENSIONS ARE ± .010 [.25] UNLESS OTHERWISE NOTED.
2. DIMENSIONS ARE IN INCHES [MM].

Ordering Information							
Part Number	LED Peak Wavelength	Sensor Output	Isolation Voltage (VDC)	t_{PLH} / t_{PHL} Max (ns)	I_F (mA) Typ / Max	V_{CE} (V) Max	Lead Length (mm)
OPI1268S	850 nm	Open Collector	20 k	100	10 / 50	18	3.6

Pb-Free (RoHS)

General Note
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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature	-50° C to +100° C
Operating Temperature	-50° C to +100° C
Input-to-Output Isolation Voltage (2)	20 kVDC
Lead Soldering Temperature [1/16" (1.6 mm) from case for 5 seconds with soldering iron] (3)	260° C
Input Diode	
Continuous Forward Current	30 mA
Peak Forward current (1 µs pulse width, 300 pps)	3.0 A
Reverse Voltage	3.0 V
Power Dissipation (1)	100 mW
Output IC	
Maximum Supply Voltage	7 V
Power Dissipation (4)	100 mW
Maximum Output Voltage	18 V
Maximum Output Current	25 mA

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	1.4	1.8	V	I_F = 20 mA
I_R	Reverse Current	-	0.1	100	µA	V_R = 2.0 V
Output IC (V_{CC} = 4.5 V to 5.25 V)						
I_{OH}	High Level Output Current	-	0.20	25	µA	I_F = 0.0 mA, V_{OH} = 18.0 V, V_{CC} = 5.25 V
V_{OL}	Low Level Output Voltage	-	0.35	0.55	V	I_F = 10.0 mA, I_{OL} = 8.0 mA, V_{CC} = 4.5 V
I_{CCH}	High Level Supply Current	-	5.5	7	mA	I_F = 0, V_{CC} = 5.25 V
I_{CCL}	Low Level Supply Current	-	7.5	10		I_F = 10.0 mA, V_{CC} = 5.25 V
Coupled Characteristics (V_{CC} = 5 V, I_F=30 mA, R_L =560 Ω)						
C_{IO}	Coupling Capacitance	-	-	2	pF	Input and output leads shorted
t_{PHL}	Propagation Delay to Low Output Level	-	50	100	ns	See Figure 1
t_{PLH}	Propagation Delay to High Output Level	-	50	100		
I_{ISO}	Isolation Leakage Current (5)	-	-	20	µA	V_{ISO} = 19.2 kVDC
I_{F+}	LED Positive Going Threshold Current	0.8	1.7	5.0	mA	V_{CC} = 5 V, I_{OL} = 8.0 mA
dv/dt	Voltage Spike Immunity	-	30	-	kV/µs	

Notes:

(1) Derate LED linearly 1.07 mW/° C above 25° C.

(2) UL recognition is for 16 kVDC for one minute. ATEX certification is for 1.5 kVDC.

(3) RMA flux is recommended.

(4) Derate linearly 1.07 mW/° C above 25° C.

(5) Measured with input leads shorted together and output leads shorted together in air with a maximum relative humidity of 50 %.

General Note

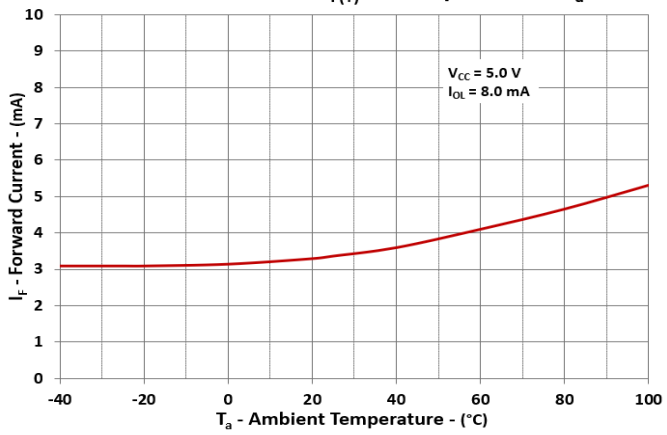
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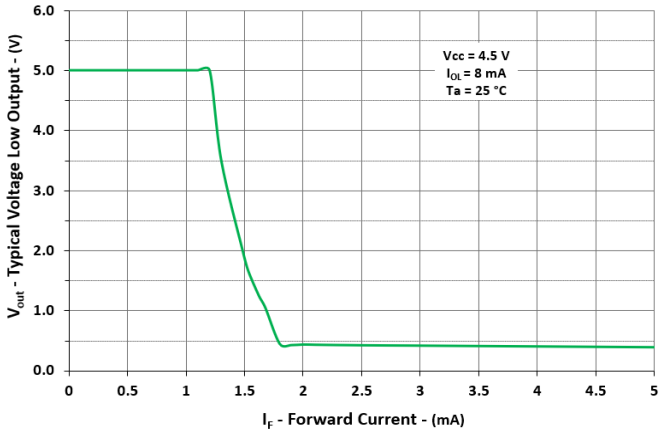
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Typical Performance Curves

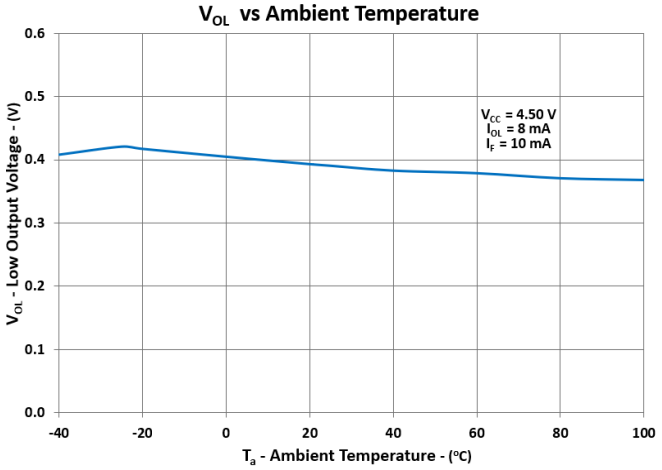
Forward Current - $I_{F(+)}$ vs Temperature - T_a



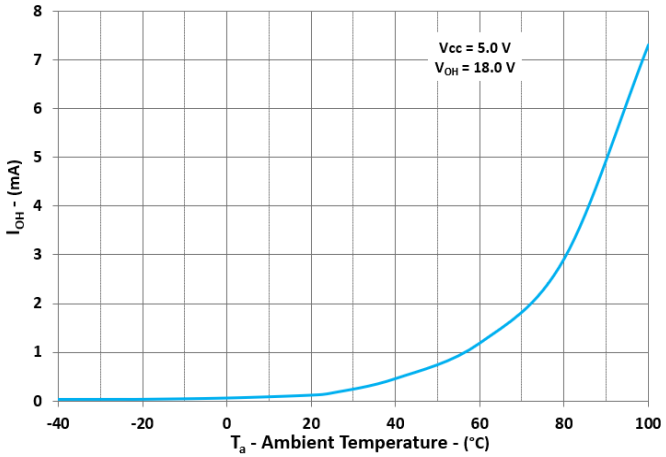
V_{out} vs Forward Current - I_F



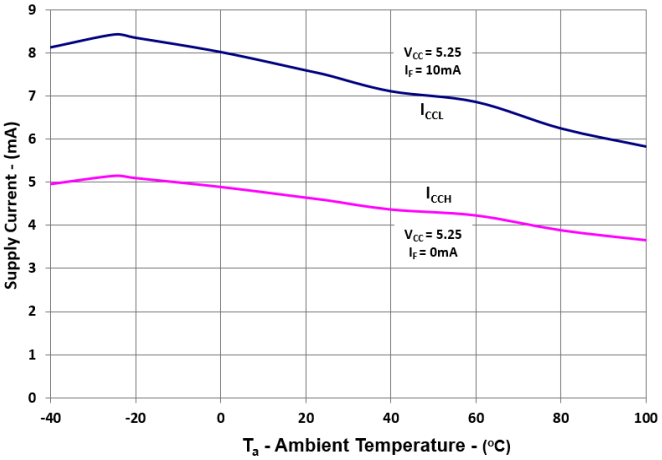
V_{OL} vs Ambient Temperature



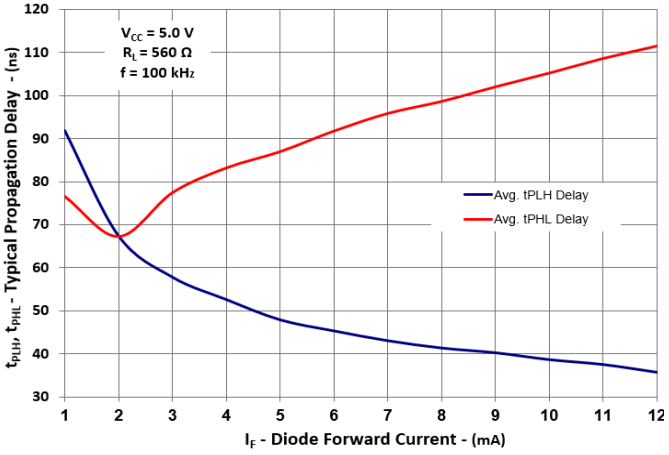
I_{OH} vs. Ambient Temperature



Supply Current vs I_{CCH} and I_{CCL} vs Ambient temperature



LED Forward Current (I_F) vs Propagation Delay - (t_{PLH}, t_{PHL})



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CIRCUIT VALUES

Condition #1: V_{CC} = 5.0V, I_F = 30mA, R_L = 560 Ohms

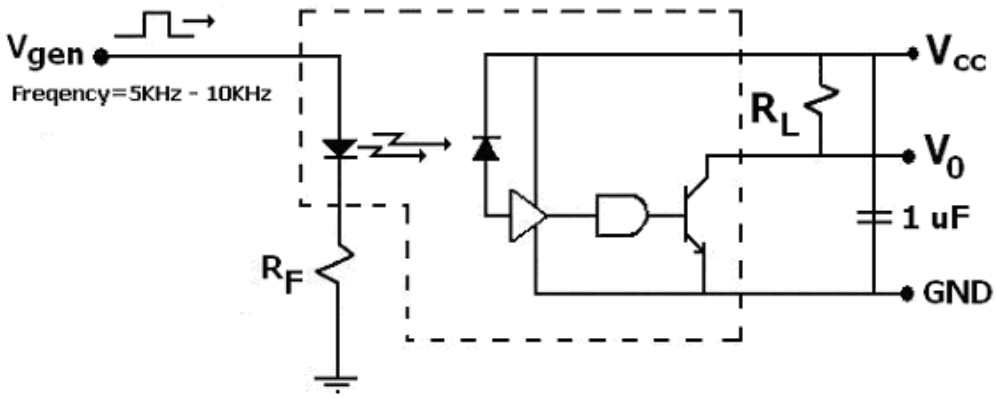
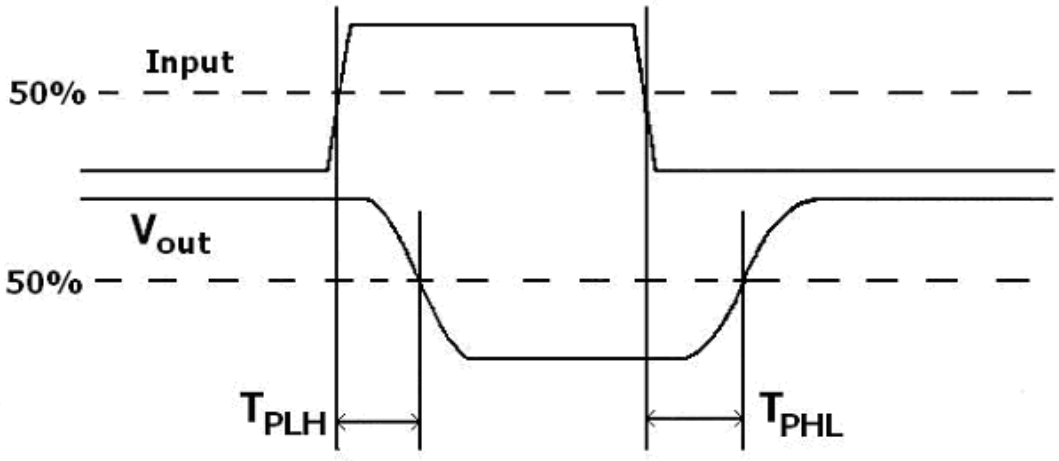


Figure 1



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