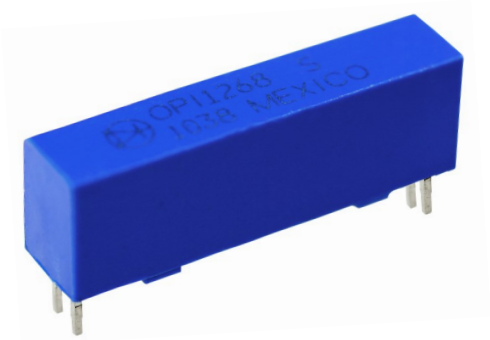
# High Voltage / High Speed Opto-Isolator

## OPI1268S



### Features:

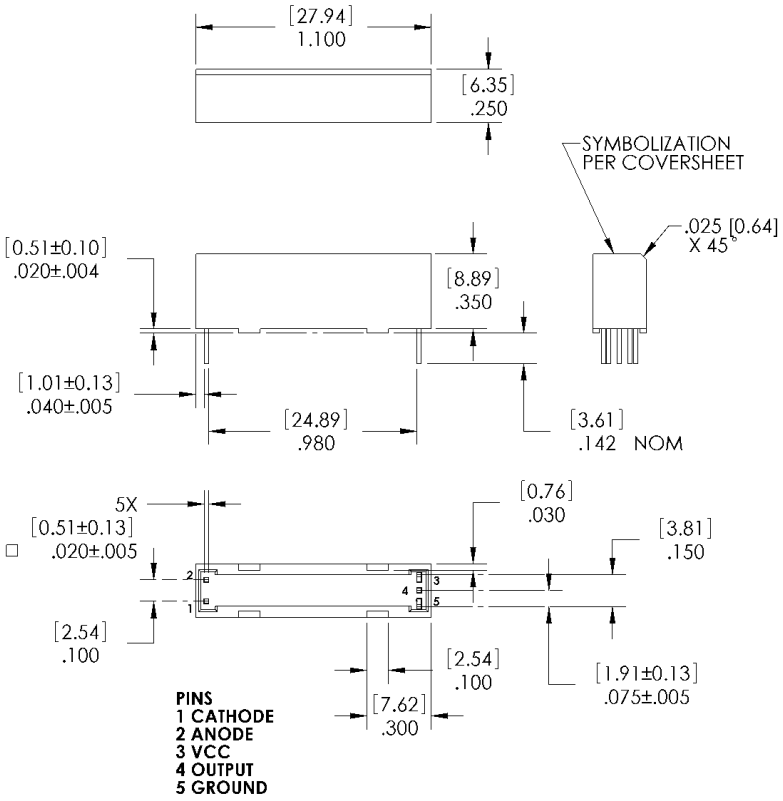
- 20 kV dc Isolation
- 2 Mbit/s transfer rate
- $t_{PHL}$-$t_{PLH}$ ≤ 50 ns typical
- Creepage path: 24 mm
- TTL Compatible
- 6 Axis / 10 $G_{RMS}$ load rating

### Certifications:

- UL File E58730
- ATEX Certification Exia IIc Ga
  EN 60079-0:2012/A11:2013
  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 OPI1268 consists of a high-efficiency GaAlAs LED with a peak wavelength of 850 nm, which is optically coupled to the output optical IC. A photologic 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.




NOTE:

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

### Applications:

- Transportation Systems
- PC Board Power Systems
- Hybrid Vehicle Systems
- Medical Systems
- Control Systems

**Pb-Free**
(RoHS)

**Ordering Information**

| Part Number | LED Peak Wavelength | Sensor Photologic® | Isolation Voltage (kV)DC | $t_{PLH}$ / $t_{PHL}$ Max (ns) | $I_F$ (mA) Typ / Max | $V_{CE}$ (V) Max | Lead Length (mm) | Lead Spacing (mm) |
|---|---|---|---|---|---|---|---|---|
| OPI1268S | 850 nm | Open Collector | 20 | 100 | 10 / 50 | 18 | 3.6 | 2.0 |

General Note
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.



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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** ($T_A$ = 0° C to 70° C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| **Input Diode** | | | | | | |
| $V_F$ | Forward Voltage | - | 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) (See OPL550 for additional information—for reference only.) | | | | | | |
| $I_{OH}$ | 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. |
| $t_{PLH}$ | Propagation Delay to Low Output Level | - | 50 | 100 | ns | See Figure 1 |
| $t_{PHL}$ | Propagation Delay to High Output Level | - | 50 | 100 | | |
| $I_{ISO}$ | Isolation Leakage Current[5] | - | - | 20 | µA | $V_{ISO}$ = 19.2 kV dc |
| $I_F$+ | 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 1.33 mW/° C above 25° C.
(2) UL recognition is for 16 kV dc for one minute.
(3) RMA flux is recommended.
(4) Derate linearly 1.33 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 %.




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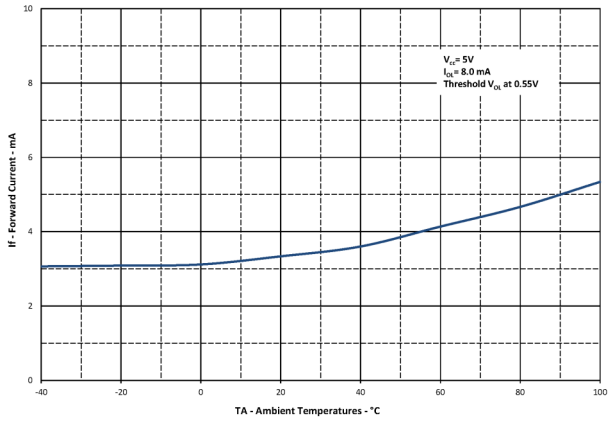
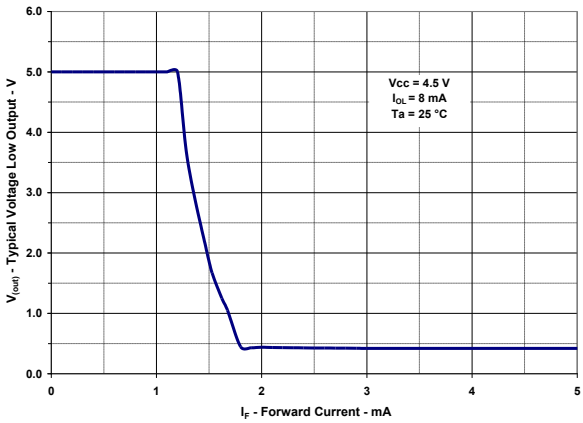
## Typical Performance Curves

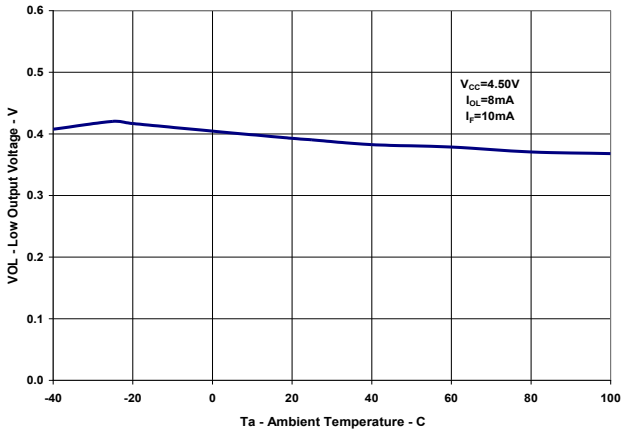
IF(+) vs Ta



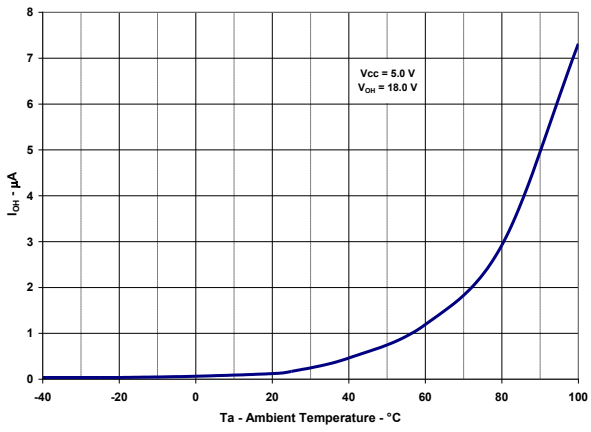

$V_{(out)}$ vs $I_F$



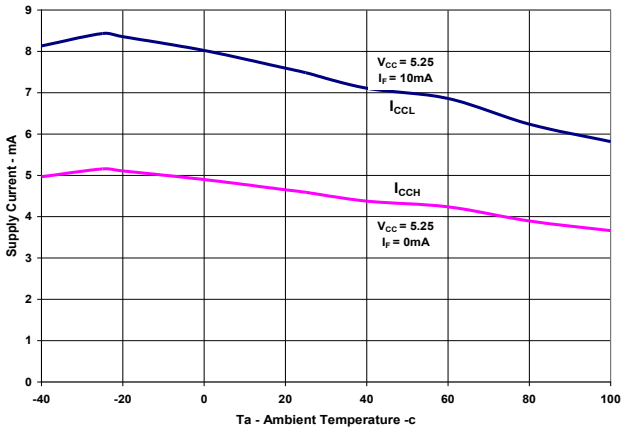

Vol vs Ambient Temperature



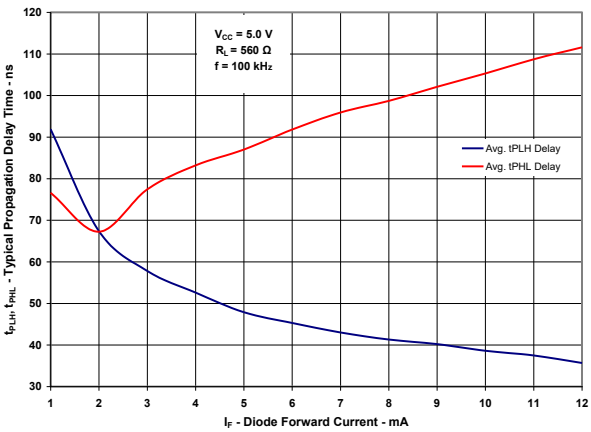

$I_{OH}$ vs. Ambient Temperature




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




Variable Diode Forward Current ($I_F$) vs Propagation Delay Time - ($t_{PLH}$, $t_{PHL}$)



## CIRCUIT VALUES

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

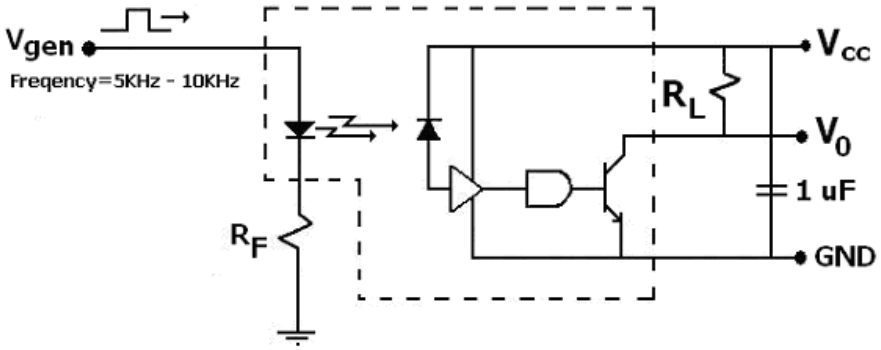



**Figure 1**