

# High Voltage Isolator

## OPI1268



### Features:

- TTL compatible output
- 16 kV dc isolation
- 2Mbit/s
- $t_{PHL}-t_{PLH} \leq 500$  ns
- Creepage path: 0.970" (24.64 mm)
- Air path: 0.970" (24.64 mm)
- UL recognized file No. E58730



### Description:

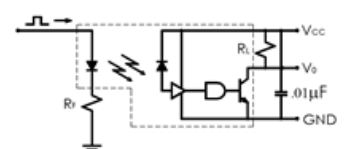
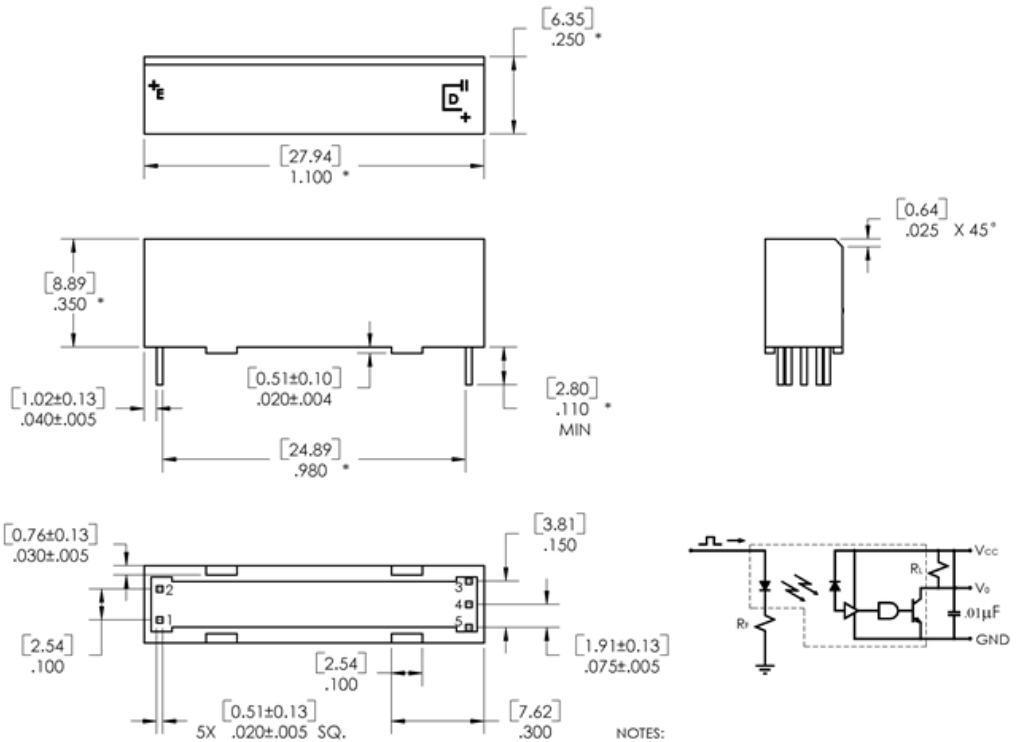
The **OPI1268** is a high voltage isolator with a digital output that is capable of high speed data transmission. The input of the OPI1268 consists of a high-efficiency GaAlAs LED with a peak wavelength of 850 nm, which is optically coupled to the output optical IC. A photodiode in the output IC detects 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:

- Data transmission for High voltage isolation
- PCBoard power system isolation
- Industrial equipment power isolation
- Medical equipment power isolation
- Office equipment

Ordering Information							
Part Number	LED Peak Wavelength	Sensor Photologic®	Isolation Voltage kVDC	$t_{PLH} / t_{PHL}$ Max (ns)	$I_f$ (mA) Typ / Max	$V_{CE}$ (V) Max	Lead Length / Spacing
OPI1268	850 nm	Open Collector	16	100 / 200	10 / 50	18	0.12" / 0.98"

Pin	Function
1	Cathode
2	Anode
3	Vcc
4	Output
5	Ground



General Note  
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## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Storage Temperature	-40° C to +100° C
Operating Temperature	-40° C to +100° C
Input-to-Output Isolation Voltage <sup>(2)</sup>	16 kVDC
Lead Soldering Temperature (1/16" (1.6 mm) from case for 5 seconds with soldering iron) <sup>(3)</sup>	260° C
<b>Input Diode</b>	
Continuous Forward Current	30 mA
Peak Forward current (1 $\mu\text{s}$ pulse width, 300 pps)	3.0 A
Reverse Voltage	3.0 V
Power Dissipation <sup>(1)</sup>	100 mW
<b>Output IC</b>	
Maximum Supply Voltage	7 V
Power Dissipation <sup>(4)</sup>	40 mW
Maximum Output Voltage	18 V
Maximum Output Current	25 mA

## Electrical Characteristics ( $T_A = 0^\circ\text{C}$ to $70^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
$V_F$	Forward Voltage	-	1.3	1.6	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	0.1	100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output IC (<math>V_{CC} = 4.5\text{ V}</math> to <math>5.25\text{ V}</math>) (See OPL550 for additional information—for reference only.)</b>						
$I_{OH}$	High Level Output Current	-	0.20	10	$\mu\text{A}$	$I_F = 0.0\text{ mA}$ , $V_{OH} = 18.0\text{ V}$ , $V_{CC} = 5.25\text{ V}$
$V_{OL}$	Low Level Output Voltage	-	0.44	0.55	V	$I_F = 10.0\text{ mA}$ , $I_{OL} = 8.0\text{ mA}$ , $V_{CC} = 4.5\text{ V}$
$I_{CCH}$	High Level Supply Current	-	4.2	7	mA	$I_F = 0$ , $V_{CC} = 5.25\text{ V}$
$I_{CCL}$	Low Level Supply Current	-	6.7	10		$I_F = 10.0\text{ mA}$ , $V_{CC} = 5.25\text{ V}$
<b>Coupled Characteristics (<math>V_{CC} = 5\text{ V}</math>)</b>						
$C_{IO}$	Coupling Capacitance	-	-	2	pF	Input and output leads shorted.
$t_{PLH}$	Propagation Delay to Low Output Level	-	-	200	ns	$V_{CC}=5\text{V}$ , $I_F=30\text{mA}$ , $R_L=560\Omega$
$t_{PHL}$	Propagation Delay to High Output Level	-	-	100		
$I_{ISO}$	Isolation Leakage Current <sup>(5)</sup>	-	-	20	$\mu\text{A}$	$V_{ISO} = 19.2\text{kV dc}$
$I_{F+}$	LED Positive Going Threshold Current	0.8	1.7	5.0	mA	$V_{CC} = 5\text{V}$ , $I_{OL} = 8.0\text{mA}$

Notes:

- (1) Derate LED linearly 1.33 mW/°C above 25°C.
- (2) UL recognition is for 16kV dc for one minute.
- (3) RMA flux is recommended. The duration can be extended to 10 seconds maximum when flow soldering.
- (4) Derate linearly 0.54m W/°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%.

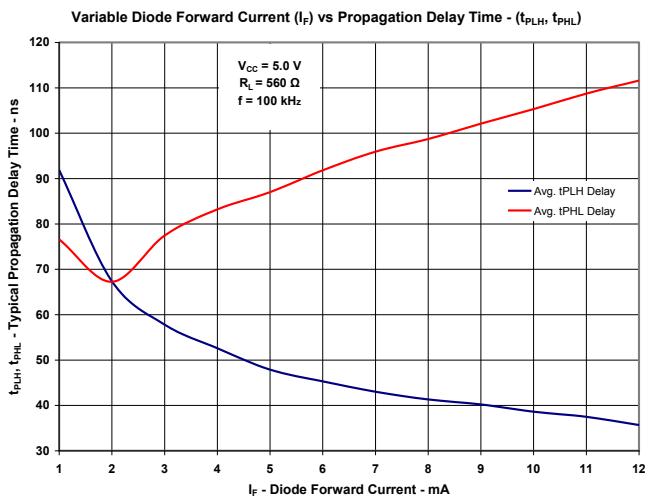
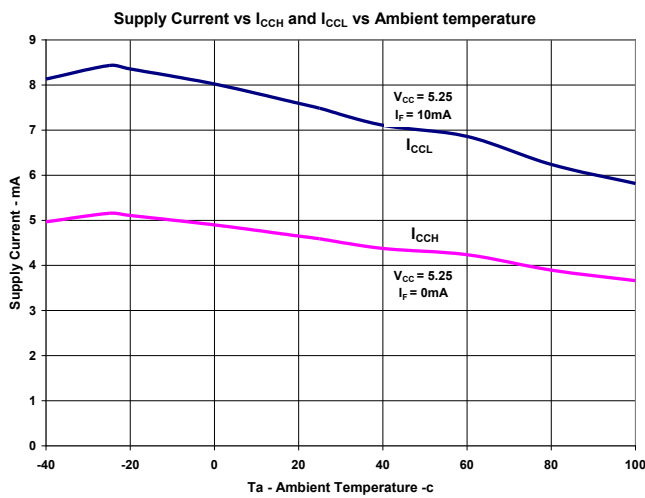
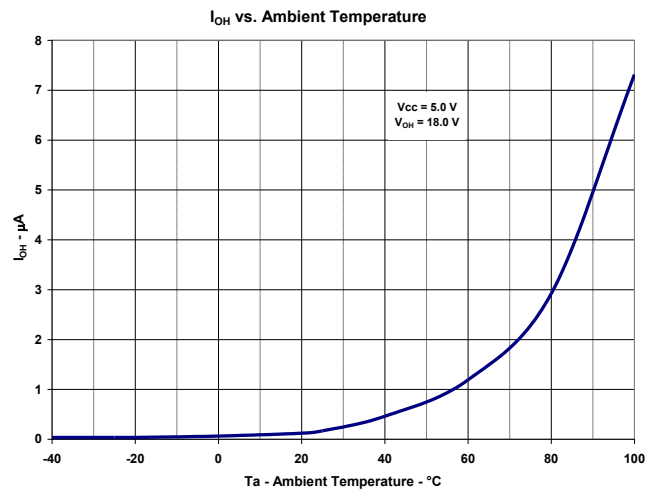
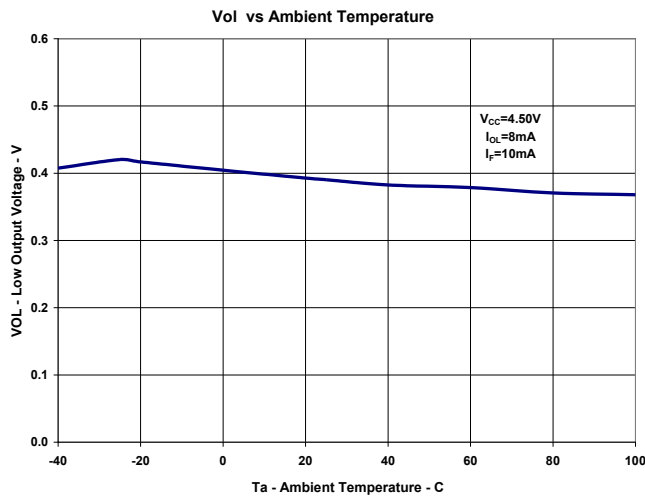
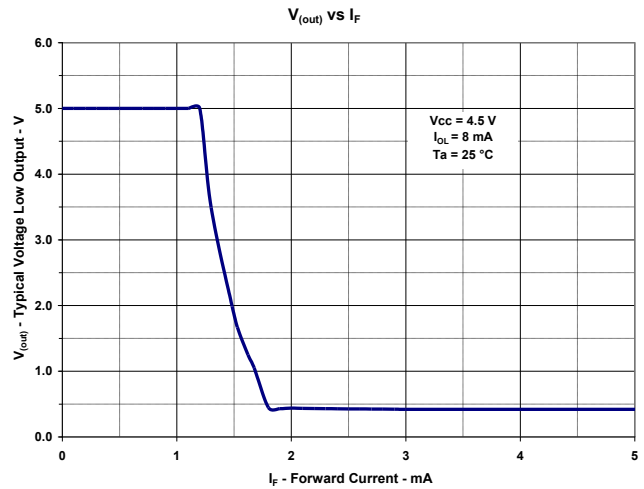
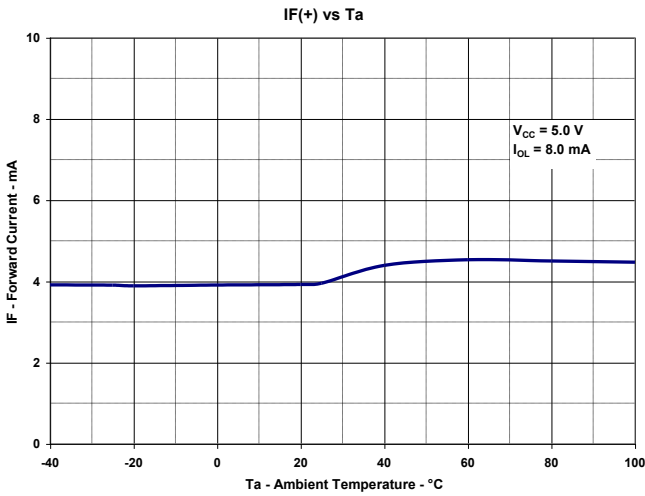
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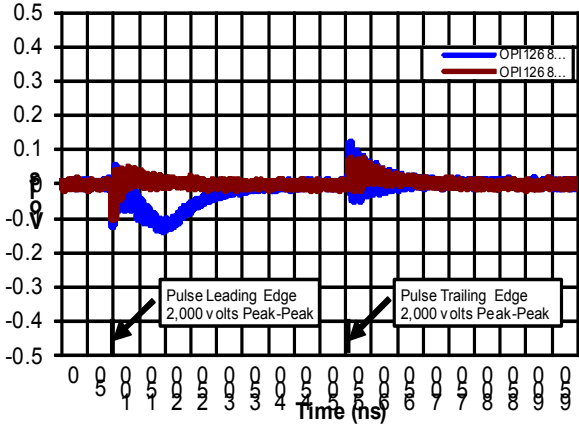
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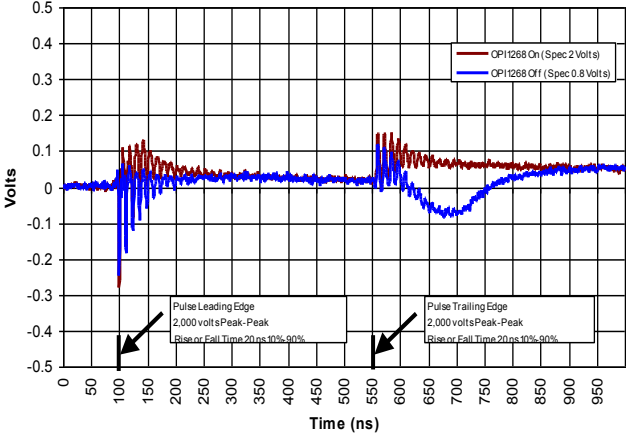


### dV/dT

OPI1268 dV/dT Emitter



OPI1268 dV/dT Sensor



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Issue	Change Description	Approval	Date
	Initial Release of OPI1266 (July 1996).		July 1996
A	OPI1268 (from PDF Catalog)		07/04
A.1	Combined OPI1266 and OPI1268 and put in new format. Inserted new package drawing.	Trevor Schelp	05/17/07
A.2	Added Note 3 on page 2	Bob Procsal	08/21/07
A.3	Updated Table on page 3	Trevor Schelp	10/01/07
A.4	Separated OPI1266 from the OPI1268	Trevor Schelp	11/27/07
A.5	Reversed tPHL & tPLH times, Removed reference to Input Diode	Trevor Schelp	05/07/2008
B	Change .01 $\mu$ F to 1.0 $\mu$ F on Figure 1. Change Peak Forward Current from 50 mA to 30 mA.	Trevor Schelp	11/11/10
C	Change "2 Mbd transfer rate" to 2MBit/s.	Trevor Schelp	11/23/10
D	Add the UL certification E58730	Cosmin Suci	4/9/15
E	Page 2 Note 1: added "m" to 1.33m W... Page 2 added Note 4: Derate linearly 0.54m W/ $^{\circ}$ C above 25 $^{\circ}$ C Removed (1) on "Input-to-Output Isolation Voltage"	Tom Osborne	
F	Deleted asterisk		

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