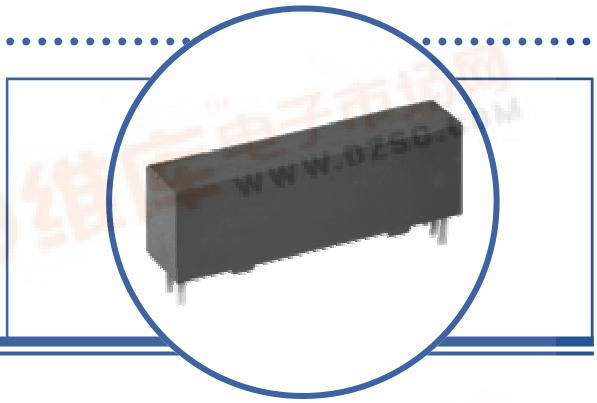
High Speed, High Voltage Optical Isolator

TT electronics
OPTEK Technology

OPI1268

- TTL Compatible Output
- 16KV Isolation
- 2Mbd Transfer Rate
- Creepage Path: 0.970” (24.64mm)
- Air Path: 0.970” (24.64mm)
- Low Propagation Delay Time



The OPI1268 is a high voltage isolator with a digital output which is capable of high speed data transmission. This device is capable of DC and AC voltage isolation between the input and output circuitry while providing TTL signal integrity.

The input of the OPI1268 consists of a high efficiency GaAlAs LED 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 in an open collector inverter configuration.

Applications include:

- High Voltage Isolation
- PCBoard Power System Isolation
- Industrial Equipment Power Isolation
- Medical Equipment Power Isolation

Ordering Information

Please order part number OPI1268

High Speed, High Voltage Optical Isolator

OPI1268

TT electronics
OPTEK Technology

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

Storage Temperature	-40° C to +100° C
Operating Temperature	-40° C to +100° C
Input-to-Output Isolation Voltage	16KVDC(2)
Lead Soldering Temperature (1/16" (1.6mm) from case for 5 seconds with soldering iron)	260° C (1)

LED

Forward Current	50 mA
Peadk Forward currnet (2 µs pulse width, 0.1% Duty Cycle)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	100 mW

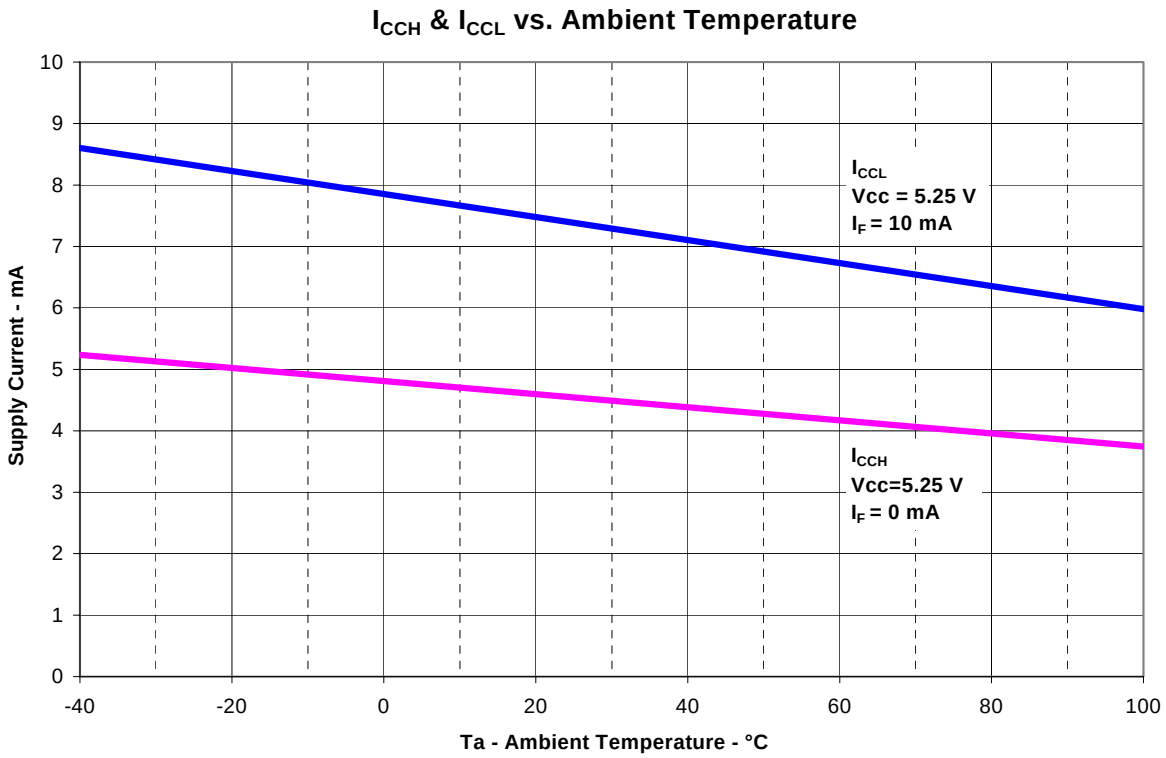
Output IC –Photologic®

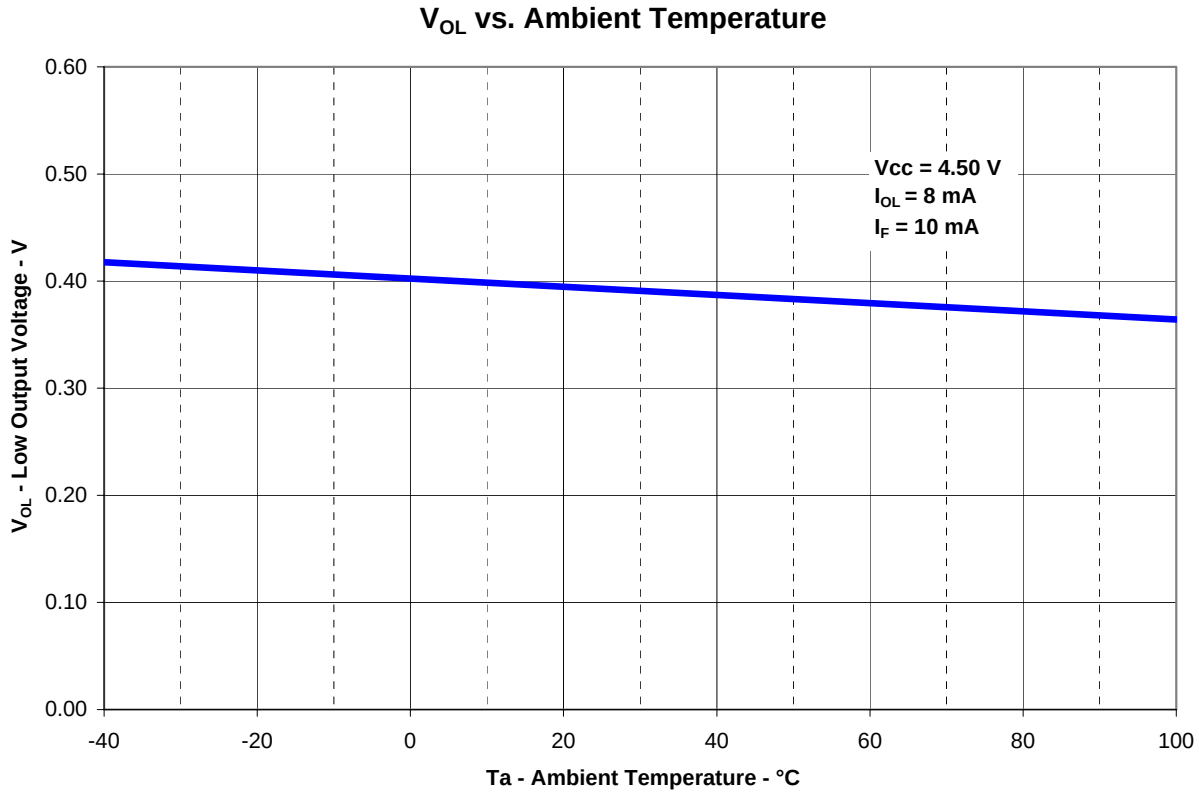
Supply Voltage Range	-0.5V to 7.0V
Output Voltage Range	-0.5V to 18.0V
Output Current	25 mA
Power Dissipation	40 mW

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

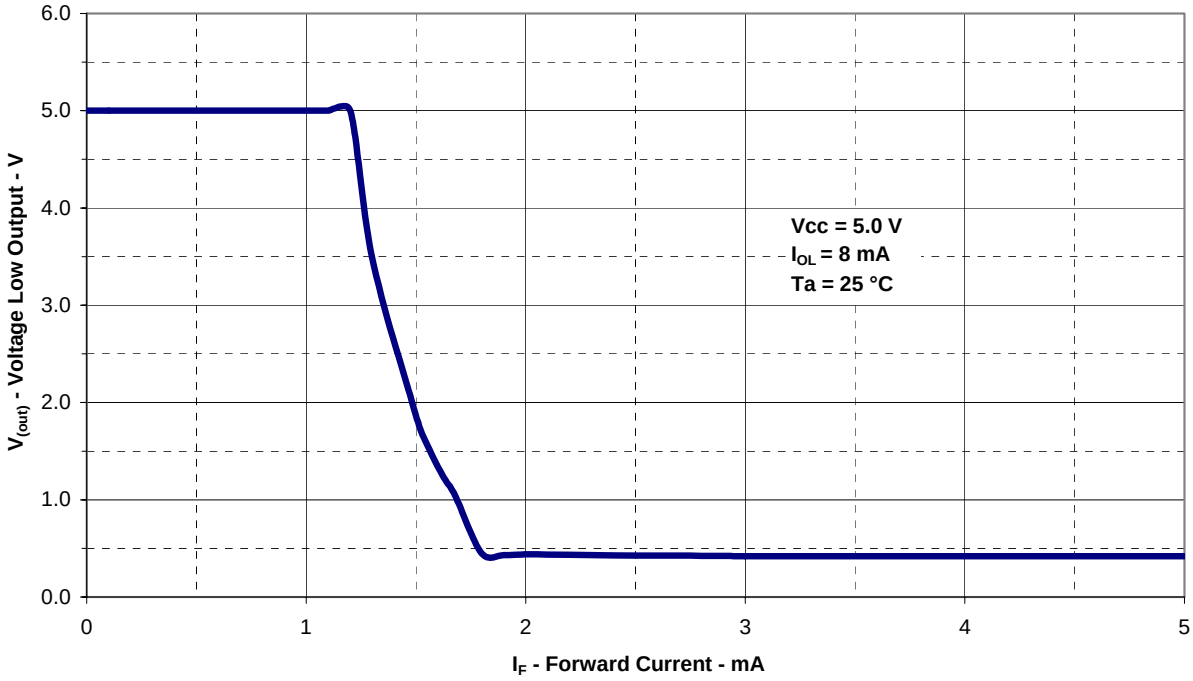
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITION
Input Diode						
V_F	Forward Voltage		1.3	1.6	V	I_F = 20mA
I_R	Reverse Current			100	µA	V_R = 3.0V
Output IC (V_{CC} = 4.5V to 5.5V)						
I_{OH}	High Level Output Current		0.25	15	µA	I_F = 0mA, V_{CC} = 5.25V, V_{OH} = 18.0V
V_{OL}	Low Level Output Voltage		0.4	0.5	V	I_F = 10mA, V_{CC} = 4.5V, I_{OL} = 8.0mA
I_{CCH}	High Level Supply Current		2.5	7	mA	I_F = 0mA, V_{CC} = 5.25V
I_{CCL}	Low Level Supply Current		6	10	mA	I_F = 10mA, V_{CC} = 5.25V
Coupled Characteristics (V_{CC} = 5V)						
C_{IO}	Coupling Capacitance			2.0	pF	Input and output leads shorted.
t_{PLH}	Propagation Delay—Low to High			100	ns	See Figures 1 & 2
t_{PHL}	Propagation Delay—High to Low			200	ns	See Figures 1 & 2
t_{PHL}- t_{PLH}	Difference in Propagation Delays		100		ns	See Figures 1 & 2
I_{ISO}	Isolation Leakage Current			1.0	µA	VISO = 7KV(RMS), input and output leads shorted
I_F+	LED Positive Going Threshold Current	0.9	4.0	10.0	mA	V_{CC} = 5V, I_{OL} = 8.0mA

Notes:
(1) RMA flux is recommended. The duration can be extended to 10 seconds maximum when flow soldering.
(2) Measured with the input leads and the output leads shorted together. Typical input/output capacitance is 0.05pF.
(3) Measured with a 1µs pulse width, 300pps.

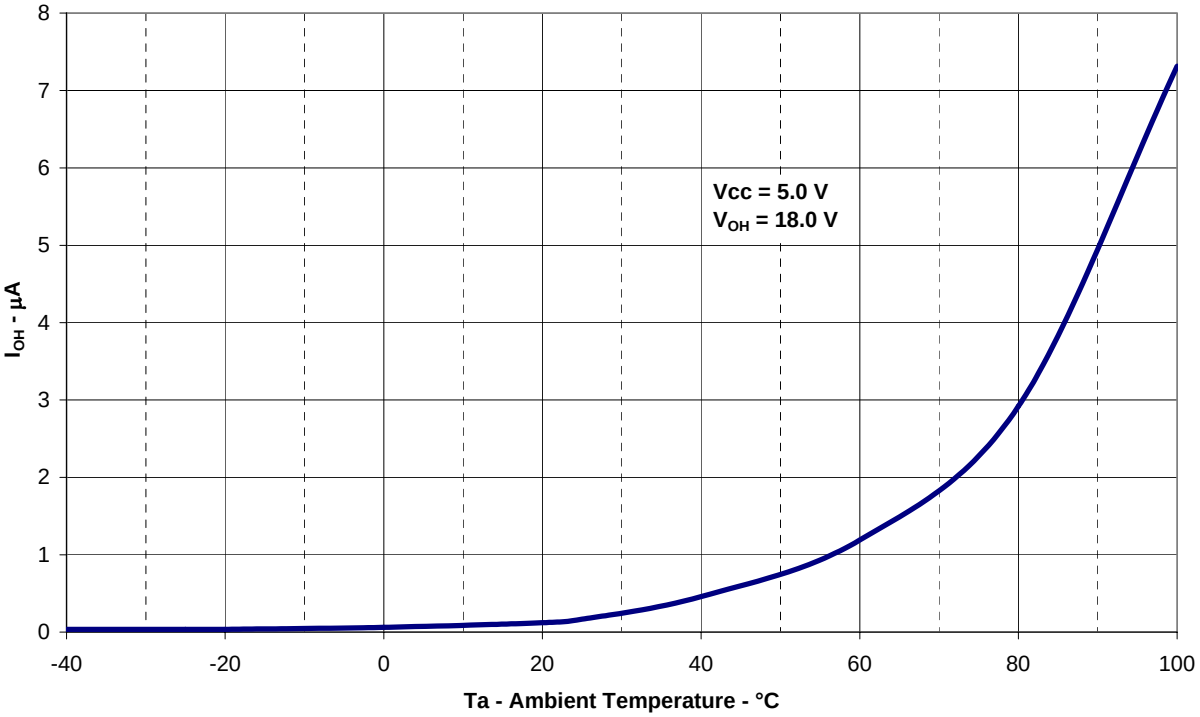

I_{CCH} & I_{CCL} vs. Ambient Temperature
Supply Current - mA
Ta - Ambient Temperature - °C
I_{CCL}
Vcc = 5.25 V
I_F = 10 mA
I_{CCH}
Vcc=5.25 V
I_F = 0 mA
0
1
2
3
4
5
6
7
8
9
10
-40
-20
0
20
40
60
80
100

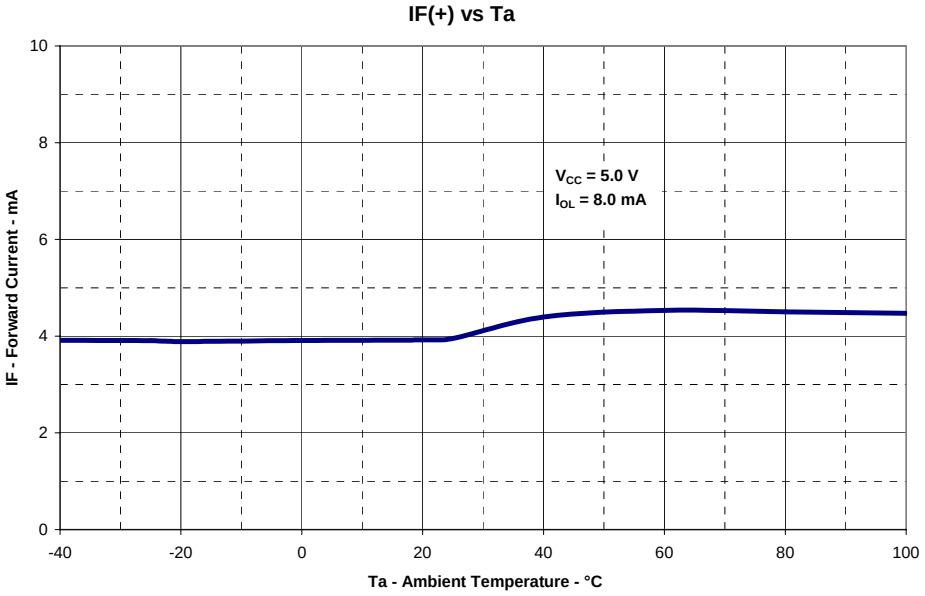

V_{OL} vs. Ambient Temperature
V_{OL} - Low Output Voltage - V
Ta - Ambient Temperature - °C
Vcc = 4.50 V
I_{OL} = 8 mA
I_F = 10 mA
0.00
0.10
0.20
0.30
0.40
0.50
0.60
-40
-20
0
20
40
60
80
100

$V_{(out)}$ vs I_F

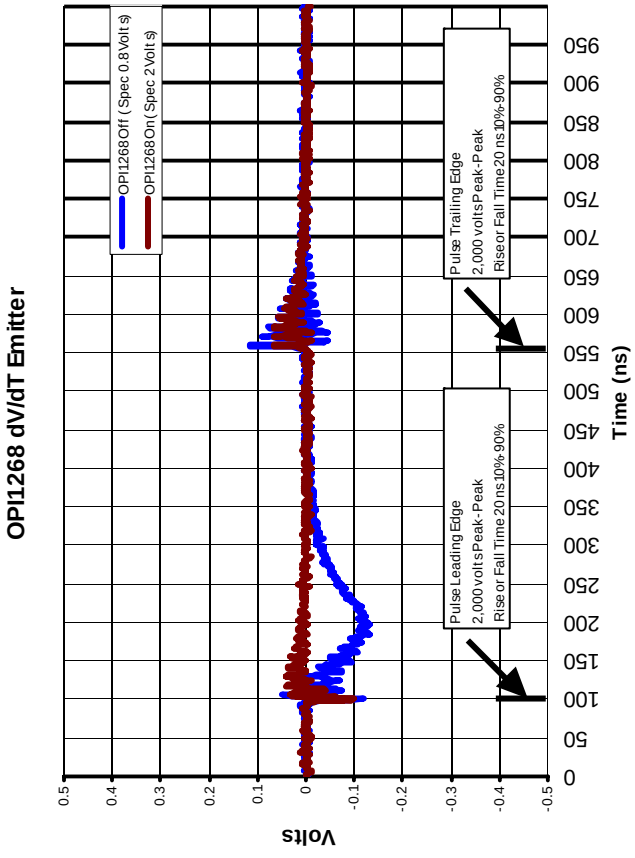


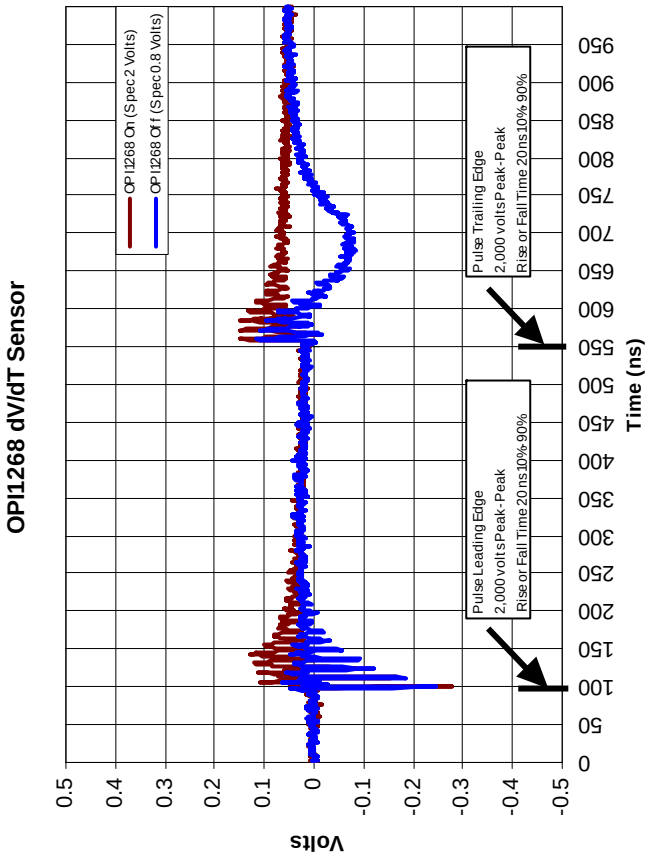
I_{OH} vs. Ambient Temperature




IF(+) vs Ta
IF - Forward Current - mA
Ta - Ambient Temperature - °C
V_{CC} = 5.0 V
I_{OL} = 8.0 mA
10
8
6
4
2
0
-40
-20
0
20
40
60
80
100

dV/dT


OPI1268 dV/dT Emitter
OPI1268Off (Spec 0.8Volts)
OPI1268On (Spec 2Volts)
Pulse Trailing Edge
2,000 volts Peak-Peak
Rise or Fall Time 20 ns 10%-90%
Pulse Leading Edge
2,000 volts Peak-Peak
Rise or Fall Time 20 ns 10%-90%
Time (ns)
Volts


OPI1268 dV/dT Sensor
OPI1268 On (Spec 2 Volts)
OPI1268 Off (Spec 0.8 Volts)
Pulse Trailing Edge
2,000 volts Peak-Peak
Rise or Fall Time 20ns 10%-90%
Pulse Leading Edge
2,000 volts Peak-Peak
Rise or Fall Time 20 ns 10%-90%
Time (ns)
Volts

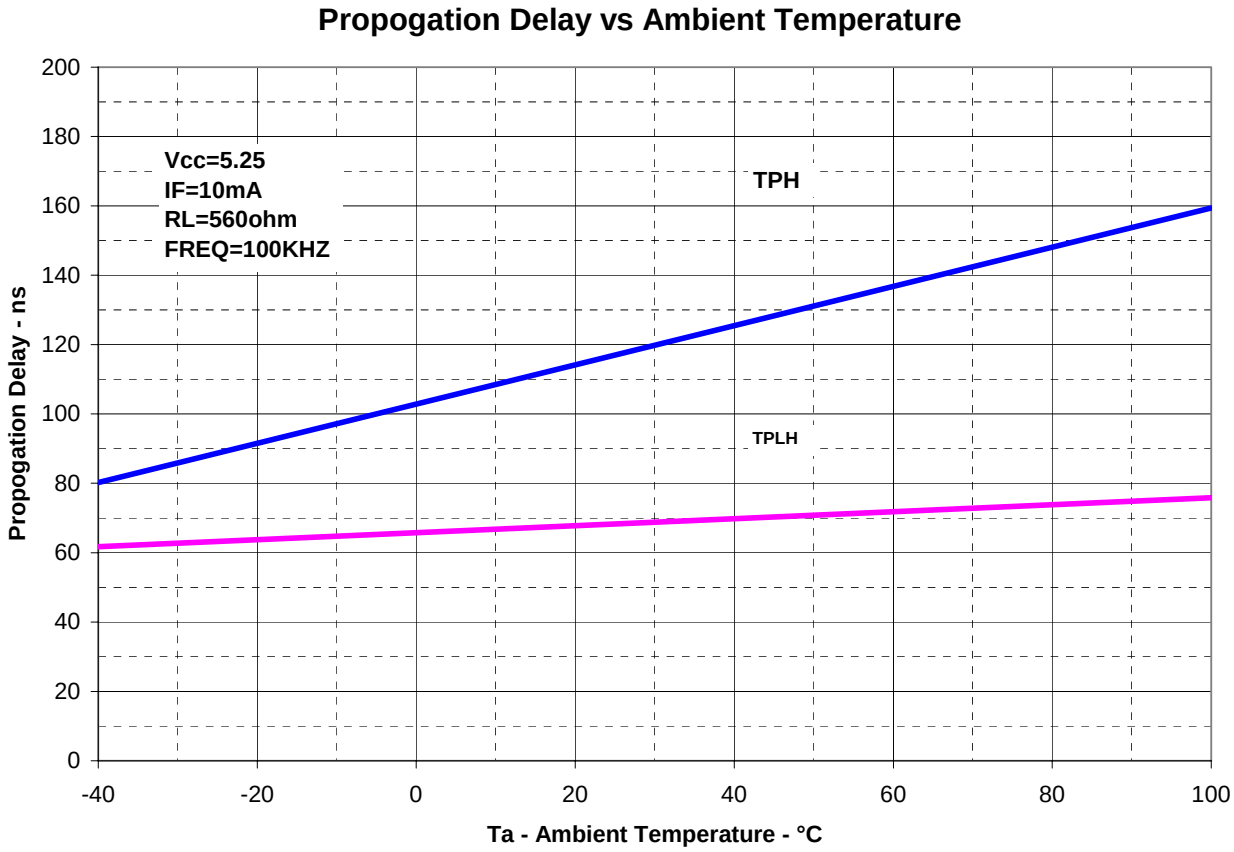


Figure 1: Propagation Delay Test Schematic

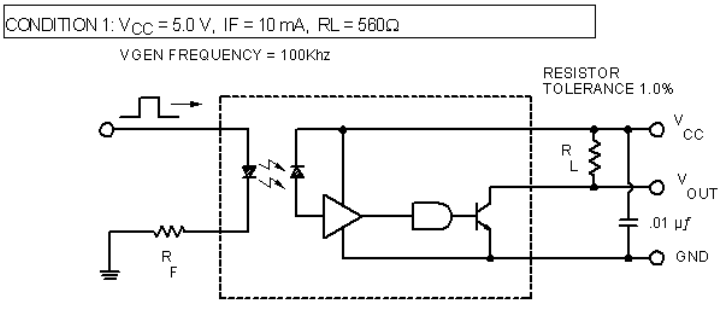
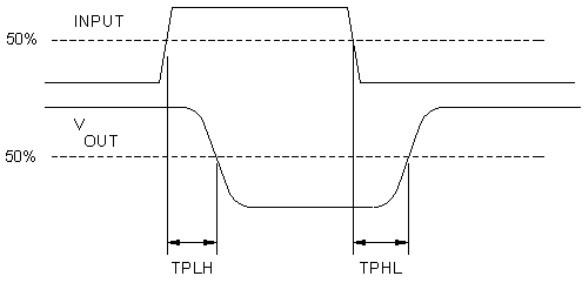
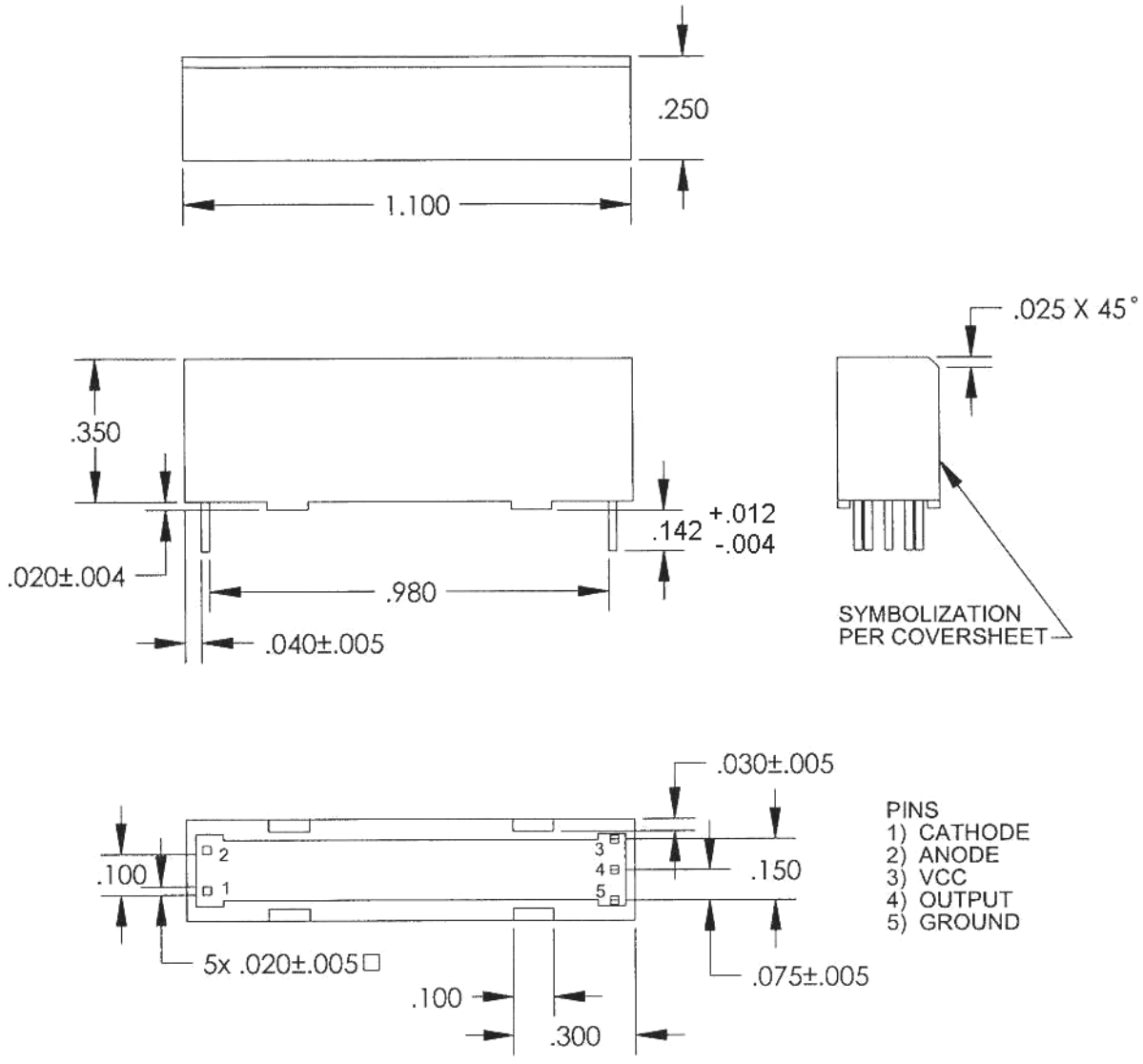


Figure 2: Input/Output Waveforms



Mechanical Dimensions:



NOTE:
1) DIMENSIONS ± .010 UNLESS OTHERWISE NOTED.