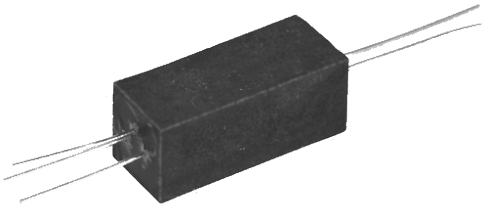
Photologic® Optically Coupled Isolator

OPI126, OPI128



Features:

- Multiple output options
- 15 kVDC input-to-output isolation voltage
- Direct TTL/STTL interface
- High noise immunity
- Data rates to 200 kBit/s
- Hermetically sealed LED and Sensor
- UL File No. E 58730*

Description:

Each **OPI126** and **OPI128** consists of an optically coupled isolator with a gallium arsenide infrared emitting diode coupled to a monolithic integrated circuit. This circuit incorporates a voltage regulator, photodiode, a linear amplifier and a Schmitt trigger on a single silicon chip. For maximum long-term stability, both the diode and the Photologic® sensor are hermetically sealed in separate packages and then mounted in a high dielectric plastic housing.

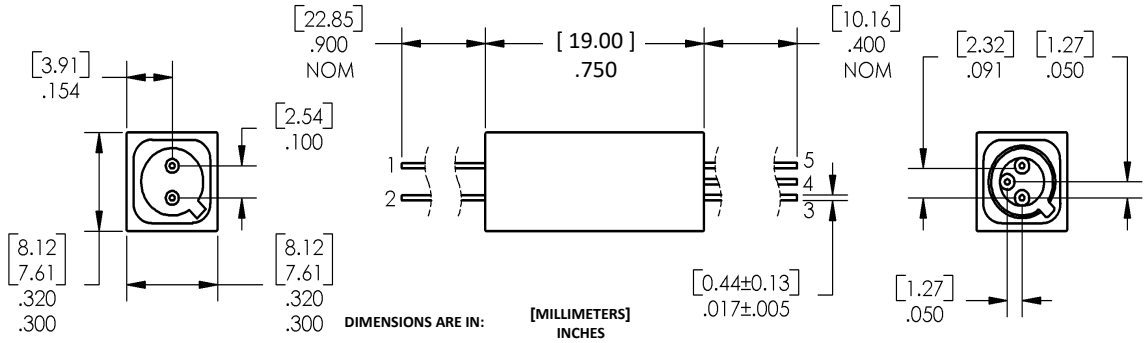
These devices feature TTL/LSTTL compatible logic level output that can drive up to 8 TTL loads directly without additional circuitry. Also featured are medium-speed data rates to 200 kBit/s, with typical rise and fall times of 70 nanoseconds.
*UL recognition is for 15 kVDC to 100° C.

Applications:

- High voltage isolation between input and output
- Electrical isolation in dirty environments
- Industrial equipment
- Medical equipment
- Office equipment

Ordering Information						
Part Number	**LED Peak Wavelength**	**Sensor Photologic®**	**Isolation Voltage (VDC)**	**t_{PLH} / t_{PHL} Typ (µs)**	**I_F (mA) Typ / Max**	**V_{CE} (Volts) Max**
OPI126	935 nm	Open Collector	15 k	5 / 5	7.5 / 25	35.0
OPI128	890 nm	Inverted Open Collector				

Pin #	LED	Pin #	Photologic®
1	Anode	3	Output
2	Cathode	4	V_{CC}
		5	Ground



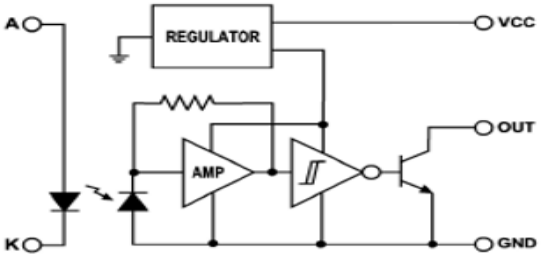
RoHS

General Note
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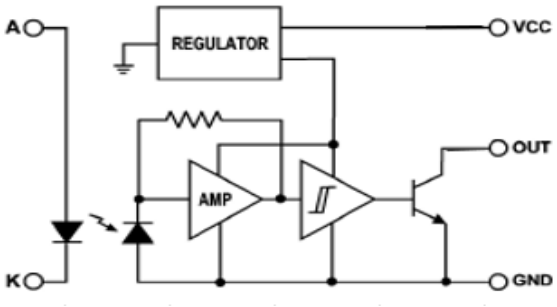
Electrical Specifications

OPI126



Light - On
Output - High

OPI128



Light - On
Output - Low

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

Storage Temperature	-55° C to +100° C
Operating Temperature	-55° C to +100° C
Supply Voltage, V_{CC} (not to exceed 3 seconds)	+18 V
Input-to-Output Isolation Voltage (1)(2)	± 15 kVDC
Lead Soldering Temperature [1/16" (1.6 mm) from case for 5 seconds with soldering iron] (3)	260° C
Input Diode	
Forward DC Current	25 mA
Reverse DC Voltage	2 V
Power Dissipation (4)	200 mW
Output Photosensor	
Output Photologic® Power Dissipation (5)	120 mW
Duration of Output Short to V_{CC}	1.00 second
Voltage at Output Lead	35 V

Notes:

(1) Measured with input and output leads shorted.
(2) UL recognition is for 15 kVDC for one minute.
(3) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(4) Derate linearly 1.33 mW/° C above 25° C.
(5) Derate linearly 3.40 mW/° C above 90° C.

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Electrical Specifications

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

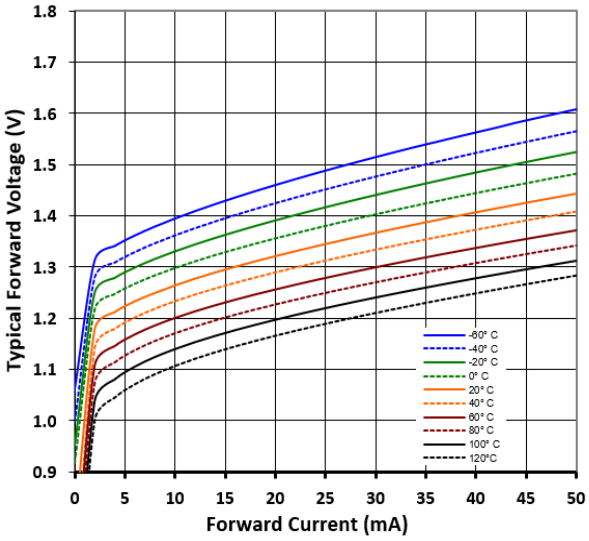
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Diode Input						
V_F	Forward Voltage	1.0	-	1.5	V	I_F = 10 mA, T_A = 25° C
I_R	Reverse Current	-	-	100	µA	V_R = 2 V, T_A = 25° C
$I_{F(+)}$	LED Positive-Going threshold Current	-	-	7.5	mA	V_{CC} = 5 V, T_A = 25° C
$I_{F(+)}/I_{F(-)}$	Hysteresis Ratio	-	1.5	-	-	-
Photologic® Output						
V_{CC}	Operating Supply Voltage	4.5	-	16	V	-
I_{CC}	Supply Current	-	-	20	mA	V_{CC} = 16 V, I_F = 0 or 7.5 mA
V_{OL}	Low Level Output Voltage OPI126 OPI128	-	-	0.40	V	 V_{CC} = 4.5 V, I_{OL} = 13 mA, I_F = 0 mA V_{CC} = 4.5 V, I_{OL} = 13 mA, I_F = 7.5 mA
I_{OH}	High Level Output Current OPI126 OPI128	-	-	100	µA	 V_{CC} = 4.5 V, V_{OH} = 30 V, I_F = 7.5 mA V_{CC} = 4.5 V, V_{OH} = 30 V, I_F = 0 mA
t_r, t_f	Output Rise Time, Output Fall Time	-	100	-	ns	V_{CC} = 5 V, T_A = 25° C, I_F = 0 or 10 mA, f = 10 kHz, D.C. = 50 %, R_L = 360 Ω
t_{PLH}, t_{PHL}	Propagation Delay, Low-High, High-Low	-	5	-	µs	V_{CC} = 5 V, T_A = 25° C, I_F = 0 or 10 mA, f = 10 kHz, D.C. = 50 %, R_L = 360 Ω

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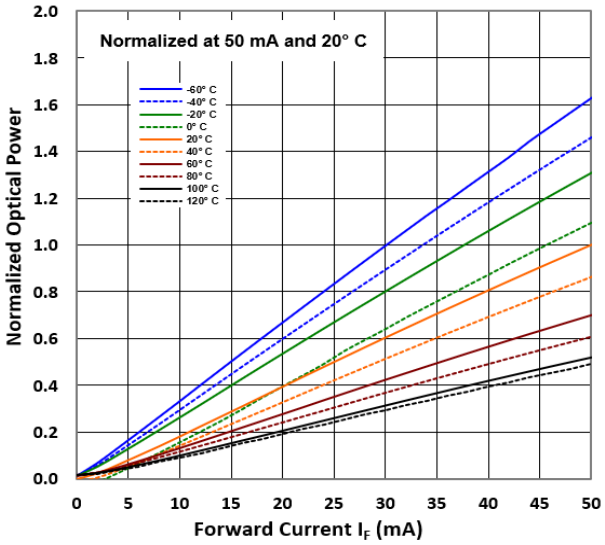
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Typical Isolator OPI128 890 nm LED Performance

LED Forward Voltage vs I_F vs Temp

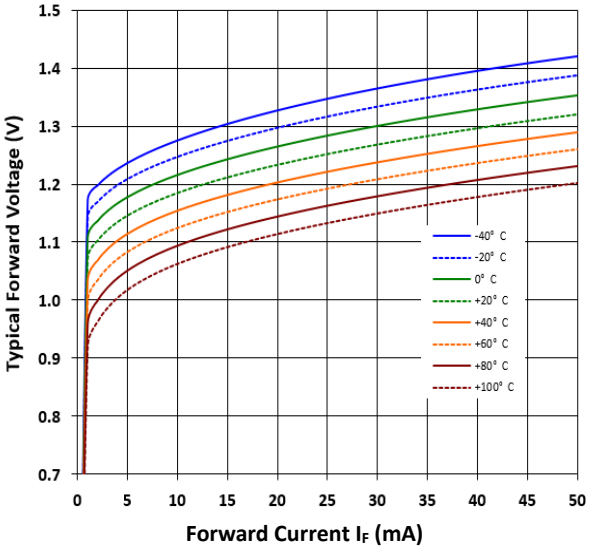


Optical Power vs I_F vs Temperature

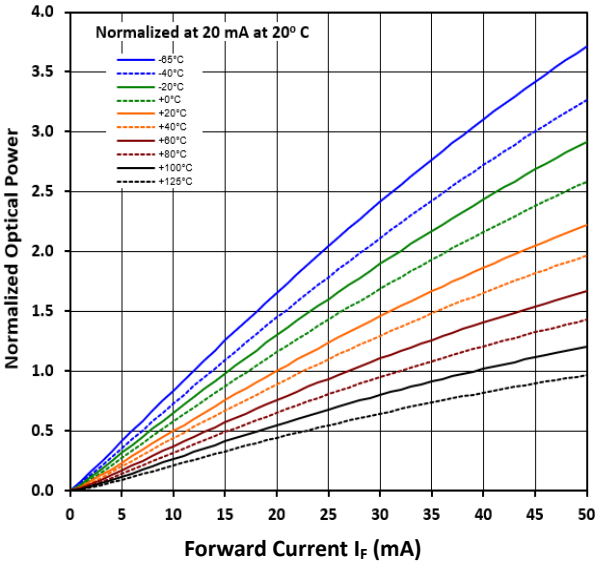


Typical Isolator OPI126 935 nm LED Performance

LED Forward Current vs Forward Voltage vs Temp



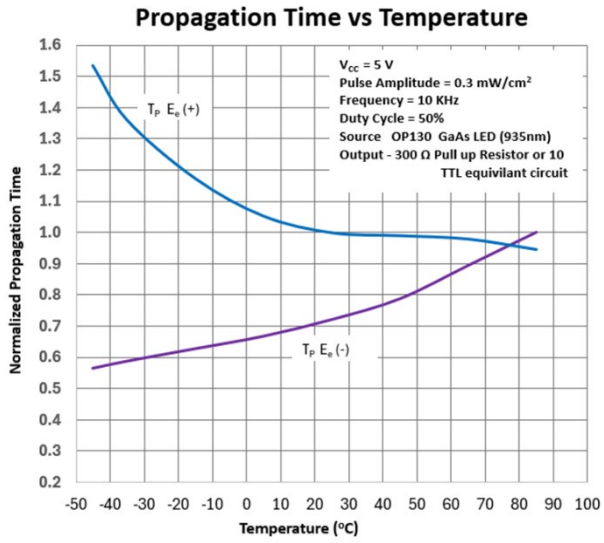
Optical Power vs I_F vs Temperature

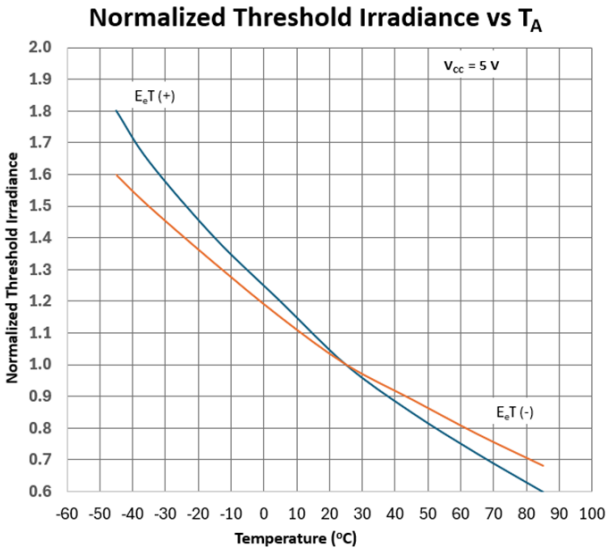


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Typical Isolator Output Photologic® Performance





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