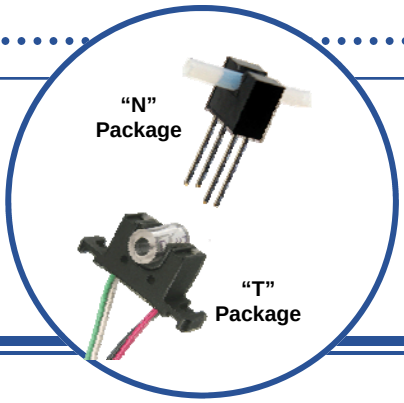
Tube Liquid Sensor
OPB350 Series

TT electronics
OPTEK Technology

Features:

- Can identify if liquid is present in clear tubes that have an outside diameter of 1/16” [1.6mm], 1/8" [3.2mm], 3/16" [4.8 mm] or 1/4" [6.3 mm]
- Opaque plastic housing enhances ambient light rejection
- Printed circuit board mounting or 24” (610 mm) 26 AWG wires



Description:

The **OPB350** series liquid sensor is designed to work with 1/16” [1.6mm] 1/8” [3.2mm], 3/16” [4.8 mm] and 1/4” [6.3 mm] outside diameter clear tubes. When output reference circuitry is added, multiple output states such as “fluid present,” “no fluid present” and “no tube present” can be recognized.

Clear liquid present causes the phototransistor to sink the maximum current, while dark liquid present causes it to sink the minimum current. As bubbles pass through the tube, the signal will vary between the “liquid present” and “no liquid” states. If no tube is present, the phototransistor sinks current between the dark fluid and clear Fluid states. The customer will have to identify the typical current values for each situation. The ratio between the different stated allows acknowledgement of different conditions.

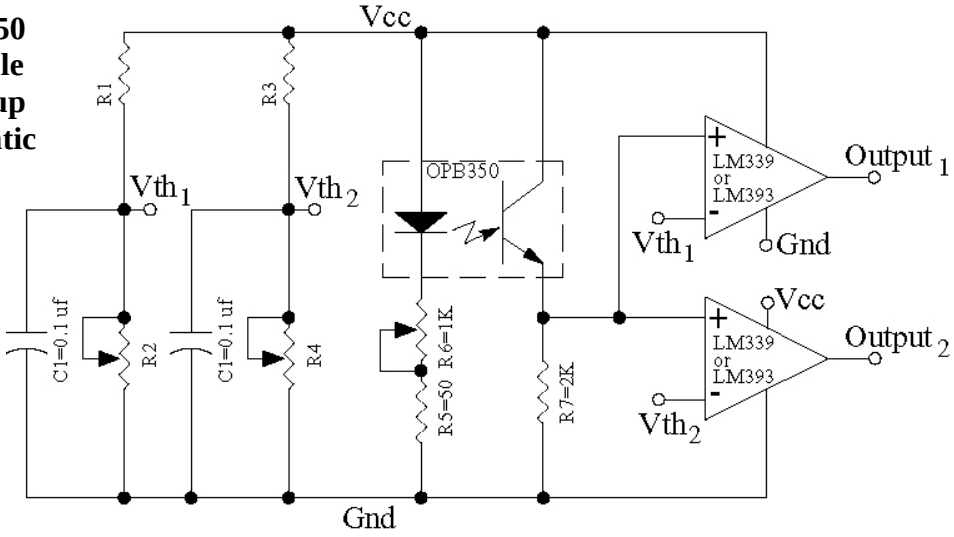
Applications:

- Non-contact fluid sensing
- IV fluid
- Oils and other petroleum products
- Colored fluids
- Toner fluids
- Water

Ordering Information

Part Number	Package	LED Peak Wavelength	Sensor	Tube Size	Lead Length / Spacing
OPB350L062	N	890 nm	Transistor	0.062”	0.330” / 0.320”
OPB350				0.125"	
OPB350L125					
OPB350L187				0.187"	
OPB350L250				0.250"	
OPB350W062Z	T			0.062”	24" / 26 AWG Wire
OPB350W125Z				0.125”	
OPB350W187Z				0.187"	
OPB350W250Z				0.250"	

OPB350 Possible hook-up schematic

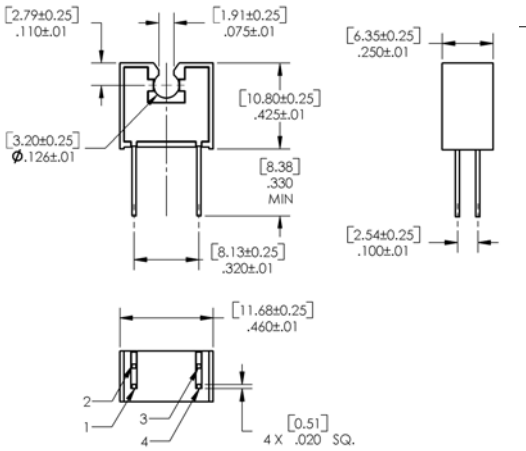


Dual Output Channels, Two Level Signaling

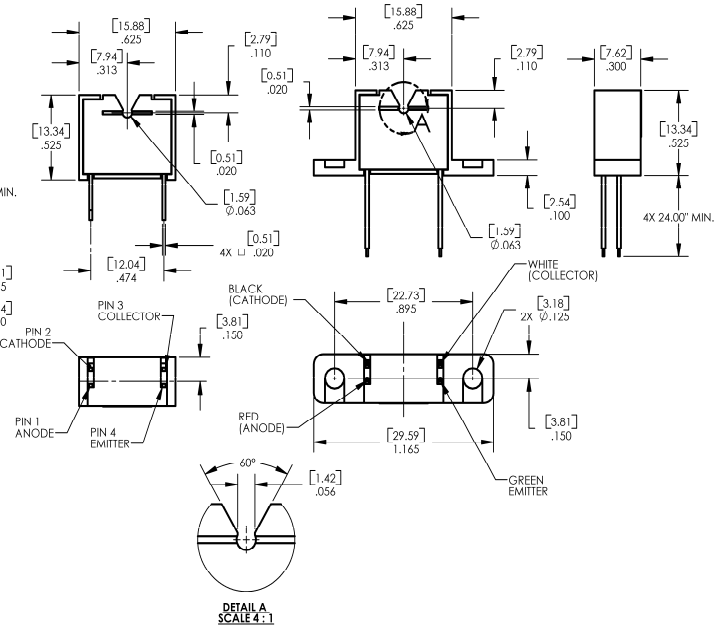
RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

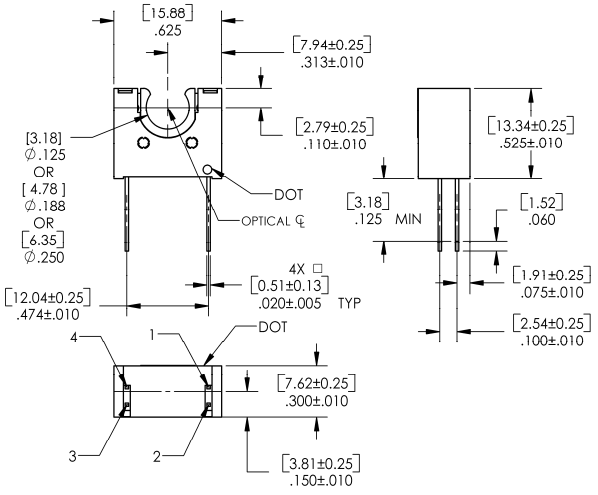
OPB350



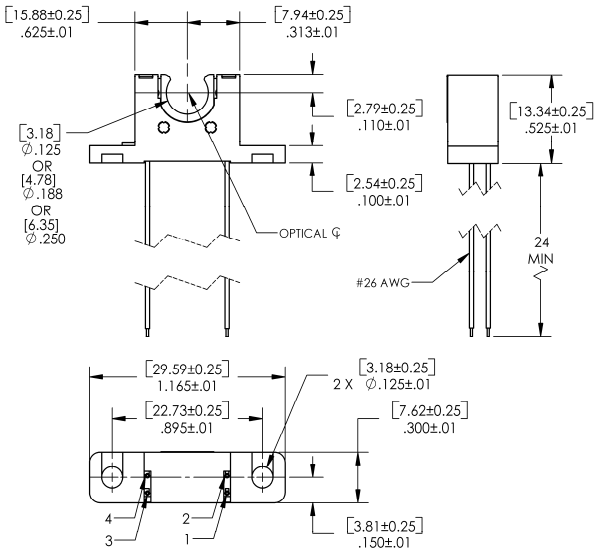
OPB350L062 & OPB350W062Z



OPB350L _ _ _

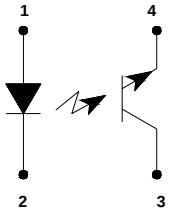


OPB350W _ _ _ Z



DIMENSIONS ARE IN: [MILLIMETERS] INCHES

Pin #	LED	Pin #	Transistor
1	Anode	4	Emitter
2	Cathode	3	Collector



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OPTEK Technology Inc. — 1645 Wallace Drive, Carrollton, Texas 75006
Phone: (972) 323-2200 or (800) 341-4747 FAX: (972) 323-2396 sensors@optekinc.com www.optekinc.com

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

Storage Temperature	-40° C to +100° C
Operating Temperature	-40° C to +85° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 sec. with soldering iron] (2)	260° C

LED

Forward DC Current	50 mA
Peak Forward Current (2 µs pulse width, 0.1% duty cycle)	1 A
Reverse DC Voltage	2 V
Power Dissipation	100 mW

Output Phototransistor

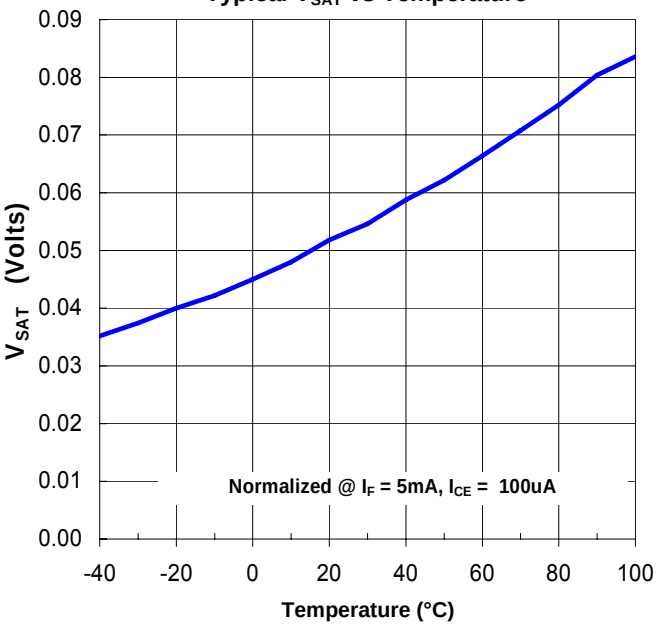
Collector-Emitter Voltage	24 or 30 V
Collector DC Current	50 mA
Power Dissipation	100 mW

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

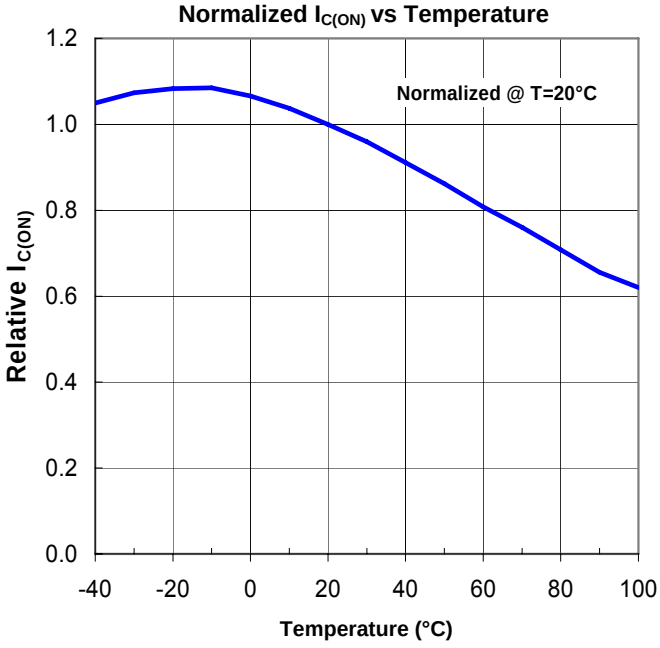
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input LED (See OP140 or 240 for additional information — for reference only)						
V_F	Forward Voltage	-	-	1.7	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2.0 V
Output Phototransistor (See OP555 [OPB350] & OP750 [-062,-125, -187 & -250] for additional info. — for reference only)						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage OPB350 **-062,-125,-187&-250**	30 24	- -	- -	V	I_C = 100 µA, E_E = 0 mw/cm^2
I_{CEO}	Collector-Emitter Dark Current	-	-	100	nA	V_{CE} = 10 V, I_F = 0, E_E = 0 mw/cm^2
Coupled						
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.4	V	I_C = 100 µA, I_F = 5 mA
$I_{C(ON)}$	On-State Collector Current OPB350_062 & Z OPB350 OPB350_125 & Z OPB350_187 & Z OPB350_250 & Z	 0.30 1.00 1.30 1.00 0.75	 0.8 3.5 3.0 2.0 1.5	 1.4 6.0 3.9 4.0 3.0	mA	V_{CE} = 0.4 V, I_F = 5 mA
On/Off Ratio	OPB350_062 & Z OPB350 OPB350_125 & Z OPB350_187 & Z OPB350_250 & Z	- - - - -	3.0 3.0 2.3 2.3 2.3	- - - - -	Ratio	V_{CE} = 0.4 V, I_F = 5 mA , I.D.=0.0312"(5) V_{CE} = 0.4 V, I_F = 5 mA , I.D.=0.0625"(5) V_{CE} = 0.4 V, I_F = 5 mA , I.D.=0.0625"(5) V_{CE} = 0.4 V, I_F = 5 mA , I.D.=0.0870"(5) V_{CE} = 0.4 V, I_F = 5 mA , I.D.=0.1250"(5)

Notes:
(1) All parameters tested using pulse technique.
(2) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(3) Methanol or isopropanol are recommended as cleaning agents. The plastic housing is soluble in chlorinated hydrocarbons and keytones.
(4) Derate linearly 1.33 mW/° C above 25° C.
(5) The on/off ratio is referenced to the I.D. as specified for a clear PVC tube with O.D. per the device dimensions. The ratio is calculated by the $I_{C(ON)}$ when the tube is filled with water divided by the $I_{C(ON)}$ with an empty tube.

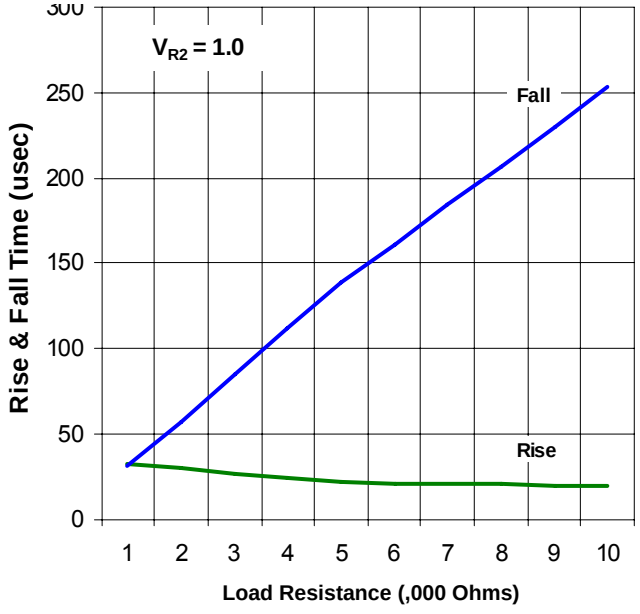
Typical V_{SAT} vs Temperature



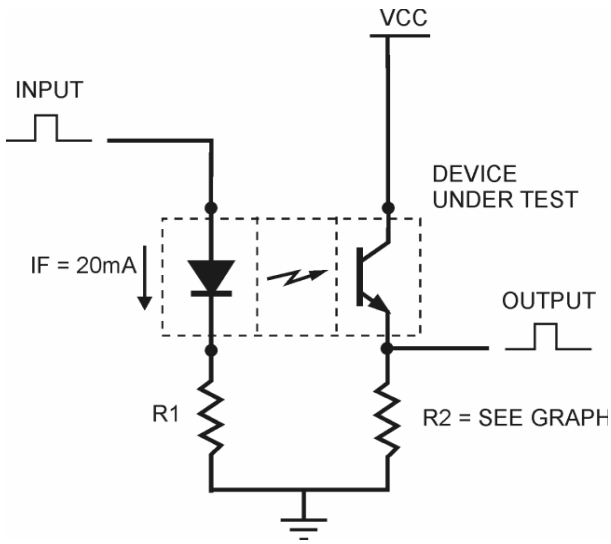
Normalized $I_{C(ON)}$ vs Temperature



Rise & Fall Time vs Load Resistance



Test Circuit (Rise & Fall Time)



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